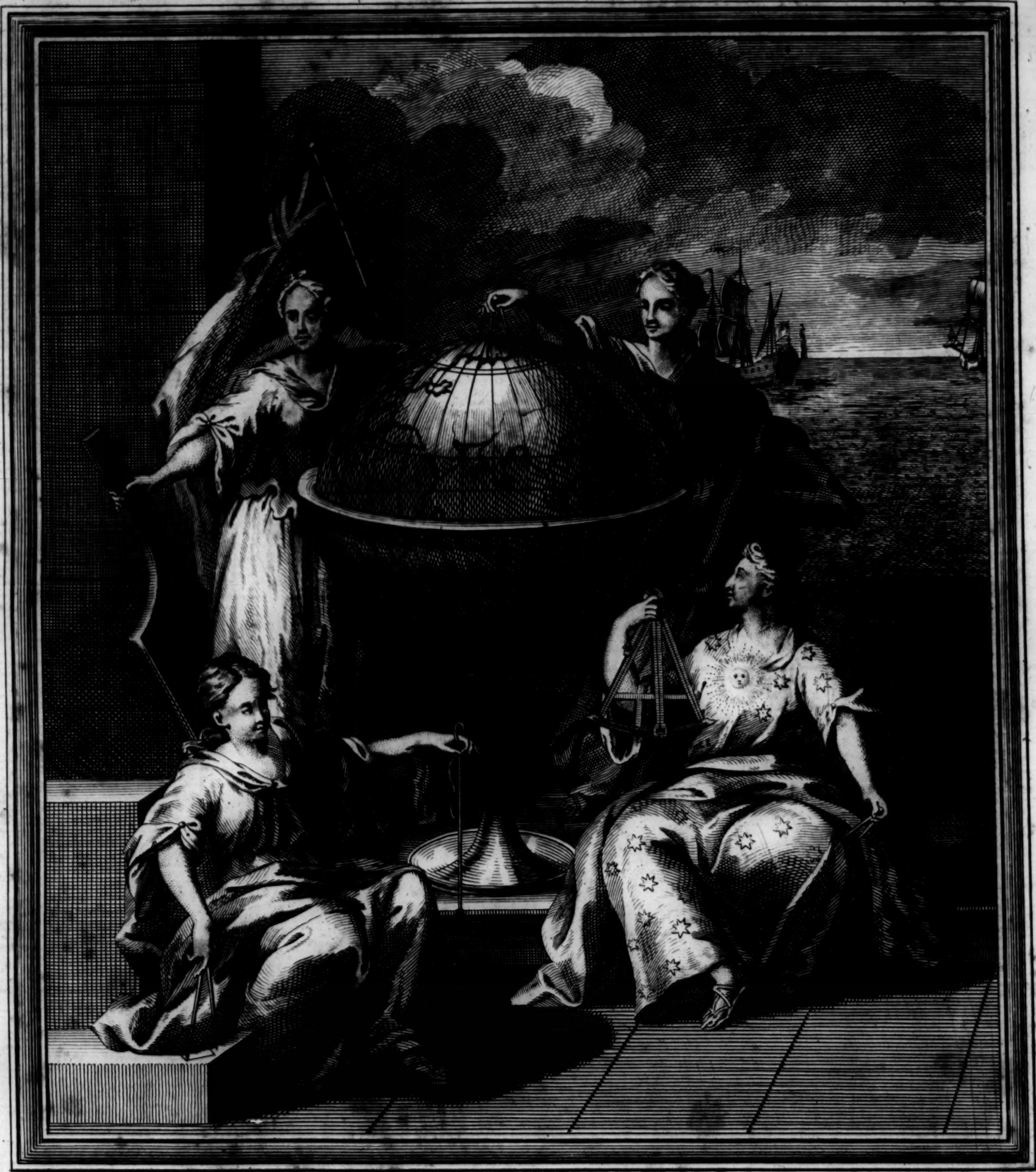




*View the great Globe, let it thy Wonder raise;
 'Twill raise thy Wonder, but transcend thy Praise.
 How far from East to West the labouring Eye
 Can scarce the distant azure Bounds descry:*

*View Cities, Armies, Fleets, of Fleets the Pride,
 See Europe's Law, in Albion's Channel ride. —
 View the whole Earth's vast Landskip unconfin'd,
 Or view in Britain all her Glories join'd.*

Young

SUNDRY

Remarks *and* Observations

MADE IN A

V O Y A G E

TO THE

E A S T - I N D I E S,

ON BOARD

HIS MAJESTY'S Ship the *ELIZABETH*,

From the Beginning of the Year 1758, to the latter End of the Year 1764.

WITH THE NECESSARY

D I R E C T I O N S

For Sailing to and from *INDIA*,

And into the several PORTS and HARBOURS thereof.

Being a proper Supplement to the NEW DIRECTORY for the *East-Indies*.

By *WILLIAM NICHELSON*,
MASTER of the said SHIP.

The SECOND EDITION, with ADDITIONS.

L O N D O N:

Printed for W. HERBERT, at No. 27. in Goulston-Square, near White-Chapel Bars,

By T. SPILSBURY, in Cook's-Court, Carey-Street, near Lincoln's-Inn.

MDCCLXXIII.

SUNDAY

Remarks and Observations

MADE IN A

V. O. Y. A. C.

TO THE

ON BOARD

His Majesty's Ship the CLAREMONT

from the 1st of January to the 31st of the Year 1784



By Order of His Majesty's Council

Printed by W. Johnston, at the Press of the Admiralty

By Authority, in the Year 1784

Printed by W. Johnston, at the Press of the Admiralty

By Authority, in the Year 1784

The SECOND EDITION, with Additions

By the same Author, in the Year 1784

LONDON: Printed by W. Johnston, at the Press of the Admiralty

By Authority, in the Year 1784

MDCCCLXXXIV

P R E F A C E.

THE many years that I have used the sea, and the many different parts of the world I have been in, particularly India, and the seven years I sailed in those seas, have given me several opportunities of making some useful Remarks and Observations, and some Draughts of the most principal Harbours in that part of the world; which were much wanted. Yet I must acknowledge I did not design them for the press when I first began them: but the commanders both of the navy and in the India service, several gentlemen in India, the governor and council of Bombay, and others both civil and military, upon seeing my Draughts, and Remarks of my Voyage, advised me to a publication of them, and voluntarily entered into a subscription for that purpose: and what has induced me the more readily to make them publick, is the great necessity I saw there was for a publication of that kind, having often experienced, at my first going to India, the want of proper directions for many parts on the Coast of India: and indeed some places of the greatest consequence, and even the best harbours in that part of the world, were badly described, and some of them not so much as mentioned; and such as were, were laid down wrong even in latitude, and more so in longitude: and also the course and distance from place to place were in many instances very erroneous, with little or no account of the soundings, which are the navigator's chief guide in the night-time, or hazey weather. My long stay in India, the many times I sailed backwards and forwards along its coasts, and the constant care I took to sound night and day, have furnished me with a perfect knowledge of the soundings in all parts of India where I have been; by which I have ascertained the true distance from the land in the different depths of water, with the true course and exact distance from place to place, and the true latitude and longitude of places, head-lands, islands, &c. Where there have been astronomical observations to determine the longitude of any place, I have mentioned it, and have computed the longitude of other places near thereunto, with great care and exactness: and I have also been very particular in observing the variation at all parts of India where I have been, and have mentioned it particularly in my description of every place, with the necessary directions for sailing in and out of harbours, the best anchorage in road-steads, with the winds and set of the currents in every month of the year; also the shifting and setting-in of the monsoons, the fair and foul-weather seasons, with the proper times for ships to make a passage from place to place. I have given likewise a description

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description of several places of consequence, which were not so much as mentioned in any directory; and have fully supplied that deficiency, not only by describing such places, but by giving plain and particular directions for sailing in and out of them, with the proper marks to avoid the dangers, the safest and best anchoring-places, &c. These places are Bombay, Trincomalay, Manilla, St. Augustine's Bay, Madagascar, and Table Bay at the Cape of Good Hope. I carefully surveyed Bombay Harbour, and have made up all deficiencies in the directions for sailing in and out of that place; and have made it still plainer, by a large and accurate Draught of that Harbour, and part of the Coast adjacent, which I have published by authority, and which is now sold by the Editor of these Remarks; as are also all my other Surveys.

TRINCOMALAY, on the Island Ceylon, is one of the finest and most spacious harbours in the known world; yet there was not so much as a single word said of it in any of our directories, though a place of such consequence for the safety of its harbour. I with great care and pains surveyed that bay and harbour, and have given a very particular description of it, with directions for sailing in and out of it; and have made a large and accurate Draught of the Bay and Harbour from my Survey, which is also published by authority, whereby the sailing in and out of that place is made exceeding plain and easy.

MANILLA Bay was not so much as mentioned in any of our directories, though a place of such note for its having the famous city of that name situated on the east side thereof: it is a capacious and safe bay, with good anchoring for ships all over it. I have also given particular and plain directions for sailing in and out of this place, was at great pains to survey the bay, and have made a large and accurate Draught thereof, which will render the sailing in and out of it plain and easy. This Draught is now likewise published.

ST. AUGUSTINE'S Bay, on the Island Madagascar. I have also been very particular in my directions for sailing in and out of this bay, with the best marks for anchoring, &c. there being nothing to the purpose said of this place in any of our directories, though it is a place much frequented: it is dangerous of access, ill described, and not well known: those that do know any thing of it keep their knowledge to themselves, and leave others to grapple their way in and out, as they did before them, as is the way of many old and experienced seamen's arguing; whereby they keep all their knowledge and experience, which a long course of years has filled them with. Their temper and disposition, being as rough as the element they were bred and so long lived on, will not let them part with any of their knowledge; for they think that, should they communicate their knowledge to others, it would lessen their own: they therefore keep it, and let it die with them, so that neither the publick nor posterity shall reap any advantage from their long lives and experience; and make as much merit in concealing their knowledge, however useful, as other men would do in communicating theirs for the
general

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general good of mankind. I have known men of such boorish dispositions. This Bay I have likewise surveyed, and the Draught is now published.

I HAVE also been very particular in my directions for sailing in and out of Table Bay, at the Cape of Good Hope, with the soundings, best anchoring-places, &c. there being no instructions in any of our directories for that place. I have also been particular in my description of the Island Diego Rayes. I surveyed Matheren Bay, on the north side of that island, and made a large and accurate Draught of it, which is also now published; as are the Draughts of Back-Bay, and the watering-places at Pulo Auore and Pulo Timoan.

As ALL our directories are in many respects found defective, as not containing the necessary lights which ought to have been transmitted therein, and not only defective, but entirely silent, with regard to the navigation in the seas about the Cape of Good Hope; this very great omission has induced me to begin my Remarks and Observations at that Cape, and from thence to continue them to India, in both the outer and inner passages, &c. wherein I have mentioned some shoals and dangers lying in the way, which, though discovered some time ago, have not been mentioned in any directory, book, or draught, that I ever saw. I have also ascertained, with great exactness, the situation of some other shoals, of which, though long since discovered, the exact situation has not hitherto been determined even in point of latitude: I have however determined both their latitude and longitude with great certainty. I have likewise given a particular description of the winds between Madagascar and the Continent at all seasons and times of the year; which Dr. Halley was at a loss to do, as in his time that navigation was not sufficiently known. And, as a proper introduction to the whole, I have prefixed a Treatise of the Winds in general, and of the shifting trade-winds, monsoons, &c. with the causes thereof, &c.

I MUST here take notice of the great uncertainty of reckonings in the Indian Seas, and how little dependence people ought to put in their reckonings in those seas, on account of the strong and uncertain currents that ships meet with; some extraordinary instances whereof I have mentioned in my Remarks, where I had occasion to speak of them, by way of precaution, in order to put people on their guard and look-out: for whatever I have said of them is truth; I have seen it in journals, and other good authors: though I must say, during the several years that I sailed in the Indian Seas, I never was remarkably deceived by them; I mean at sea, any distance from the land: as to the currents coastwise, you will find them as strong, uncertain, and changeable, at different times of the year, as I have mentioned them.

I AM rather of opinion, that ships reckonings are often much out by their want of attention to the length of their half-minute glasses, the measurement of the log-line,

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and to the heaving of the log. I have often sailed in company with ships that have been in a fresh gale of wind, sailing eight, nine, or ten knots, when we have not gone so fast by one, one and a half, or sometimes two knots; yet they only sailed a-breast, and did not go an inch a-head of us. These ships must have many more miles on their board in twenty-four hours than we, and in running the distance of a thousand leagues would make a number of leagues difference. This I have often experienced in a passage, that ships in company have made one-fifth, (or sometimes more difference) in the distance run, more than we have done, entirely owing to their paying no regard to the length of their glasses, and to the marking their log-line too short; which is an abominable and shameful neglect, as it can so easily be avoided, and otherwise may be attended with the most dangerous consequences. Another great mistake in heaving the log is, the too often sending the young and inexperienced people of the quarter-deck to heave the log, who are entirely incapable of judging what allowance to make, whether there has been more or less wind, or more or less sail made; or if the wind is hauled more forward, or come more aft, since the log was last hove, &c. This is a matter that requires the nicest inspection and judgment of the most experienced and judicious officer, but is too often neglected.

PEOPLE too frequently take it for granted, that the glasses are the just length they are marked upon the end, or sometimes both ends, with a pen and ink, 28, 29, or 30 seconds, which, I have reason to believe, are marked by guess, without any regard to the true time; for I have always made it a rule to try and prove the glasses before the ship sailed out of port to proceed on her voyage to sea, and scarce ever found a glass marked right: I have seen one marked 27 or 28 seconds, which I have found upon trial to be full 30; and others, that have been marked 30 seconds, which have not run more than 28. Thus people are led into an error by marking their line according to the time of the glass, as they find it marked, without trying or proving its exactness, which is very easily done, and what I would recommend to all commanders of ships to see done, as a thing of the greatest consequence to them, particularly in long voyages.

AND when the half-minute glasses are proved to be 30 seconds, which is what they should be, then should the log-line be marked 50 feet to each knot; that being, according to the opinion of those learned men who have measured a degree of the meridian in different parts of the earth, the most exact proportion to the measurement of a terrestrial degree, and what I have always marked the log-line: and in general I found my reckonings as exact as most people's, in either long or short voyages. And, if it so happen, that a person should have no glasses of 30 seconds, then let the log-line still be marked in the same rule of proportion; which is,—If a glass of 30 seconds give 50 feet to a knot, how many should a glass of 28 seconds give? &c. Answer, $46\frac{2}{3}$ feet to a knot, &c.

HOWEVER, I would not have any to depend upon, or trust too much to, their dead reckoning, in broad seas, for their longitude; but to convince them of its error, by comparing

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comparing the longitude, by account, with the variation, and the known longitude of the islands, capes, or headlands, they are near, according to the variation: and this, I will venture to say, is far more to be depended on, in India voyages, than any other method yet discovered.

THIS attention is what I could wish every seaman would pay to the variation, and not so blindly to follow a practice, that common sense must convince every man is subject to error in every part; I mean the dead reckoning, particularly in broad waters, and any extensive navigation, where the height and quick increase and decrease, as well as change of the variation, is evidently as certain a guide as the sun at noon, for discovering the latitude: this induced me to begin with those testimonies that may lead others to pursue a track, in which, as there is a certainty, so there is a safety; for by celestial observations none can err; and this must undoubtedly make passages more expeditious, as well as secure.

MANY are the fatal consequences that have befallen the ships in the India trade, from people's not paying a due attention to the variation, which is still too much neglected, as from very recent instances is evident, some having been wrecked on the Coast of Guinea, others on the Cape de Verde islands, and others run ashore on the Coast of Brazil, merely through inattention to the variation; for, were they strictly to observe the variation, and make it their sure guide, which undoubtedly it is, they could not commit such gross errors: I shall therefore mention what I myself have pursued, and found unerring, and what is approved of, and supported by the opinion of some very experienced commanders in the India service.

THE course and distance from the Lizard to Madeira, or going through between the Western islands and Madeira, is so well known, that it is unnecessary to say any thing about it: but, when to the southward of St. Mary's, in 33 deg. 40 min. N. and variation 10 deg. 30 min. W. or under 11 deg. if a leading-wind, you may steer a S. S. W. course till you are the length of the westernmost of the Cape de Verde Islands. Close by them, to the westward, there is 7 deg. W. variation: with 6 deg. 30 min. you may venture boldly to sail to the westward of them, night or day; and when the length of the westernmost, steer S. by E. till past St. Jago; and then S. S. E. and cross the line with about $5\frac{1}{2}$ deg. W. variation, in or near the meridian of St. Jago.

I HAVE passed the Cape de Verde Island to the eastward as well as westward, and in sight of the Island Sall, to the eastward of it, in lat. 16 deg. 50 min. long. from London, 22 deg. 2 min. W. had 7 deg. 33 min. W. variation, and in lat. 17 deg. N. 1 deg. 26 min. to the eastward of Sall, had 9 deg. W. variation. With 8 deg. or any thing above that, you may venture to sail by them night or day, being well assured, with that variation,

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variation, that you are to the eastward of them. The Isle of May bearing S. W. 5 leagues, had variation 7 deg. 30 min. W.

It therefore has surpris'd me, that any ship, with such a guide, should either split on those islands, or be wrecked on the Coast of Guinea, or Brazil: yet I have known a ship pass to the eastward of all, and afterwards run ashore to the westward of St. Augustine's, on the Coast of Brazil.

BEING in the latitude of Sall, with 8 deg. W. variation, a ship should certainly steer S. by W. till past Bonavista, and then S. by E. to cross the line: with this course you will make between 4 and 5 deg. easting, by the time you are in lat. 4 deg. N. where you will meet with little winds, and variable, mostly in the S. E. quarter, which will oblige you to stand to the south-westward to cross the line, by which you will run down all the easting you had made from St. Jago, and will cross the line nearly in the meridian of St. Jago, with 5 deg. 30 min. W. variation.

OFF St. Augustine's, which is the easternmost point of Brazil, the variation is 3 deg. E. therefore, did not people pay too implicit a regard to their dead reckoning, and were they sufficiently circumspect at the change of variation from west to east, I will take upon me to say it is impossible they could err in their navigation.

THE variation off	Fernando Noronha, in lat. 3 deg. 50 min. S. longitude	D. M.
from London 32 deg. W. is	— — — — —	1 57 E.
The variation off the Abrolhos is somewhat more than 4 deg.	— — — — —	4 5 E.
In sight of Trinidad and Martin Voz	— — — — —	2 45 E.
Off the pitch of the Cape of Good Hope	— — — — —	19 30 W.
In running to the eastward in 36 deg. S. to enter the Gut of Madagascar	— — — — —	26 55 W.

WITH this variation, or when you begin to decrease the variation, steer in N. E. for to the southward of St. Augustine's Bay there is no more than 23 deg. It is a received opinion, but a very mistaken one, that the highest variation is off the head of Madagascar; for, in fact, it is nearest mid-channel, or rather nearest the African shore.

The highest variation, entering the Gut of Madagascar, begins in lat. 34 deg. 30 min. S. and 8 deg. 30 min. to the westward of St. Augustine's Bay, being 26 deg. 55 min. W. which variation continues to the north-eastward for 80 or 90 leagues, to lat. 31 deg. S. long. 6 deg. 24 min. to the westward of St. Augustine's Bay, where there is 26 deg. 43 min. W. variation: from this, as you run to the north-eastward, it decreases; for in lat. 28 deg. S. and 5 deg. to the westward of St. Augustine's Bay, there is 25 deg.

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25 deg. 30 min. W. variation; and in the same latitude, 7 deg. to the westward of St. Augustine's Bay, there is 24 deg. 29 min. W. variation; and near Madagascar, in sight thereof, a little to the southward of St. Augustine's Bay, there is but 23 deg. W. variation.

THIS shews that the variation is a sure and safe guide to enter the Gut of Madagascar by; and until longitude shall be discovered, and made practicable to the navigator, I shall recommend the variation to him as his surest and unerring guide in any extensive navigation, where the height and quick increase or decrease, as well as change, is evidently as certain a guide as the sun at noon-day, for discovering the latitude.

I CANNOT but lament the great disadvantage this nation lies under for want of a proper use being made of our sea-journals. With what concern have I looked at the heaps of journals that lie useless in our great marine houses! in many of which the judicious and experienced navigator, with great care and pains, has made many just and useful remarks, I dare say, with an intention that they should be of use some time or other, either to the present age, or posterity; but, as it happens, they are not likely to be of use to either.

WHAT a national advantage would it be, to have not only proper offices where all journals are delivered into, but proper persons to inspect such journals, and pick out such useful remarks as might be found in them! whereby we should be enabled to make the most correct sea-charts, &c. and at the same time be furnished with the best directories, of our own making, for all parts of the world, and should then not be beholden to other nations for them so much as we are at present. And, in order to excite emulation in our navigators, if those of the greatest capacities, and who had used their utmost diligence in making the most accurate observations and useful remarks, should be noticed in a particular manner, by being rewarded with a medal, or having their names made honourable mention of to the publick (which would gratify some men more than a rich present;) this method of acting would induce every man, capable of making such accurate observations, or useful remarks, to contribute all in his power towards the publick good, when at the same time it would tend so much to his own honour and reputation.

AND, if a fund were established for defraying the expences attending the publication of such charts, maps, and books of directions, which should be all published at the charge of the publick, and by proper authority; then should we act in a manner becoming ourselves, hereby giving suitable encouragement to navigation and to navigators. And this is only what other nations may reasonably expect of us, since we are allowed to be the greatest maritime power in the world, and whose fleets have struck terror into our enemies, and failed victorious, not only in the European seas, but to the very remotest parts of the globe, both east and west; whilst our trade and commerce were carried on with great
C
success

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success to the most distant regions of the earth; the sea being Britain's native element, on which it seems as if it would not suffer any other nation to vie with her, and on which she has been famous for the warlike achievements of her fleets; whereon the safety, wealth and honour, of Britons, so much depends: then is not our supineness, and neglect of these important regulations, a reproach to us, who are masters of the seas, and whose trade and commerce are extended to the utmost parts of the known world? and is it not reasonable, the theory of navigation should owe its improvement to that nation whose sea-officers are allowed to excel all others in the practical part thereof?

I CANNOT sufficiently admire the judgment and good policy of the French nation, who have a board of navigation, where all journals are not only deposited, but examined into, and their useful remarks properly applied; and all maps, charts, and books of directions, are made and published by their authority; and they have been at great expence and trouble to send proper people abroad to make astronomical observations, as also to measure a degree of the meridian, in different parts of the world, in order to determine the exact figure of the earth; and all this at the publick expence, or rather (in France) at the king's expence; which must greatly tend to the improvement of navigation, be a particular gratification to the minds of the learned and curious, and of general utility, not only to France, but to all other nations. This reflects great honour on the French; and for this I revere them much: and it is greatly to be wished we could once see such a spirit in England for the improvement of navigation, in its different branches, at the publick expence: we might then hope to have correct maps, charts, and sea-directories of our own; which would certainly be a national advantage, and a great improvement in navigation, and would do signal honour to this kingdom; whereas, at present, the case is too much the reverse. What a national happiness would it be, if we were but as ready to imitate the French in their wise and prudent management in affairs of consequence, as we are in their foolish foppery, and ridiculous trifling fashions of dress, &c. ! by which we greatly expose ourselves to the ridicule of foreigners, and, I think, must appear contemptible even in our own eyes: yet nothing is good or handsome, except it be French, or made in the French mode. Is it not a strange infatuation, that a nation in other respects rational, and whose sense and judgment are, in general, indisputable, should yet absurdly follow only the ridiculous customs and foibles of another people, and neglect to adopt any of their wise maxims, or imitate their prudent examples? Extraordinary and unaccountable as this infatuation of the English may appear, yet, to our shame be it said ! it is undoubtedly so.

I SHOULD not do justice to the commanders in our India service, did I not particularly mention them, in this Preface, as a set of gentlemen of great experience in navigation, and well qualified for their long voyages to the remotest parts of the Eastern world. I have had the pleasure of being acquainted with several of them, whom I know to be
expert

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expert and judicious navigators; and have also perused their journals, which, if properly made use of, would be of publick utility. I acknowledge myself obliged to some of these gentlemen for assisting me with their remarks, as well as for confirming me in my opinion in some other respects; and am also obliged to them for the subscriptions with which many of them were pleased to favour me, in order to enable me to carry on this work; and I hope they will, in the course of their service, not only enrich themselves, but be instrumental also in enriching their country with regard to improving its navigation, which some of them are very capable of doing.

BUT, before I conclude, I cannot forbear taking notice of a practice so inconsistent and absurd, that one would really wonder how it should have become so common in use, especially by those whom, from their long experience, one might naturally expect to have known better, were there not too many examples thereof; and that is, navigators keeping their ship, when in the wide ocean, so close to the wind, with their sails as sharp trimmed as they can make them; whereby they will not go above 3 or 4 knots: whereas, by keeping the ship a point further from the wind, she would make less lee-way, and almost double her distance. I would particularly recommend this method in passing the S. E. trade, outward-bound to India, and in the N. E. trade, homeward-bound from India, in order to get the sooner into the westerly winds way, which they will meet, in about 30 deg. of latitude, on either side the line. The highest easterly variation I made in S. lat. was 2 deg. 54 min. E. and the least westerly variation in N. lat. homeward-bound, was 3 deg. 37 min. W. which was in the latitude of the northernmost of the Cape de Verde Islands. I am persuaded, that this method of acting would shorten India voyages very considerably, and must therefore be approved of by every seaman of judgment.

THESE Observations and Remarks I have the more willingly submitted to publick view, that time and opportunity might rectify mistakes, and that, by the addition of fresh observations, and the industry of art, the whole might, at length, be improved into a common stock of useful knowledge.

I N T R O-

INTRODUCTION.

I THINK I cannot introduce the Remarks and Observations on my Voyage to the East-Indies better, than by giving some account of the nature of winds and currents in general; and therefore shall immediately begin with an account of

The Motion of the Winds, as depending on the Course of the Sun.

Since the heat of the sun both raiseth and supporteth the air, inasmuch as it is the subject matter of the wind, and solely disposeth it to descend again, merely by the composition of his lighter rays with the heavier air, puffing it up spherically, and letting it sink alternately by condensation, when they are withdrawn, as it were, to fill up the vacuity left behind them; and, in regard the sun at once both enlightens and warms one hemisphere of the globe, and turns around it in twenty-four hours, it must draw the wind after it by the same means, and the same way, in all places successively, from pole to pole, in compliance with its westerly motion.

But not at the same rate, running a thousand miles an hour upon the equator, with Easterly respect to the earth's superficies, which, at the poles, are shut up in a point; from trade-winds whence increasing his speed, pariform to the different lengths of the intermediate parallels, perpetual. and the swifter his course grows, moving the air still more and more effectually; the wind, adhering to his diurnal course, upon its advance to about thirty degrees of either latitude, blows to the westward perpetually, especially at sea, where no land-impediments fall in its way, either to obstruct or divert it.

And although, pursuant to his diurnal course from east to west, (which is so swift and direct between the tropicks) the wind moves constantly towards the same quarter; yet still, with due regard to his annual declination, it deflects more northerly or southerly, according to the different seasons of the year, without a dependance on any other cause, inasmuch as its blasts soar aloft in the air, where its flux is most uniform, and easily inclined to follow those solar impressions; but, in regard its natural tendence declines it towards the center of the earth, and it falls at last upon the surface either of sea or land, it must, in some measure, be regulated by the conduct of their situations, especially at land, where its surface is rough to hinder its speed, or oblique to deflect its course.

Again, notwithstanding the water's superficies be smooth for the wind to glide easily over it, and of its own nature preponderates the incumbent air, which is much lighter, and consequently apt to float upon it, without ruffling its plain into any disorder; yet, in regard they are both liquid bodies, to cleave close together, and are withal effectually applied to each other by the superincumbent atmosphere; the superjected wind and the substrate

sea must mutually stir up each other's motions, the former by its weight, and the latter by its volubility, where it has room to roll; and, by consequence, the flux of the sea must share with the rays of the sun, in their sway over the wind between the tropicks, and very effectually too, when the space of their cohesion is of a large extent, and their joint motion is constant and perpetual.

Westerly
winds on the
equator.

Hence it is effected, that the same wind, which was first carried westerly by the diurnal course of the sun, now, secondly, declined by his annual motion more north and south, thirdly, is often deflected more obliquely by the inclination of the shores, and, fourthly, is returned back again periodically from near the opposite points by the sea's situation, which is, finally, (by the concurrence of its flux underneath) carried perpetually quite contrary to the diurnal course of the sun, (which first set it on foot) even upon the equator itself, for five hundred leagues together.

Now the flux of the ocean, sharing with the motion of the sun, in his conduct of sea-winds in general within the tropicks, and both being alike concerned in the management of the trade-wind in particular, it falls very opportunely to shew, what respect that wind bears to their joint direction in several seas, at what seasons, and on all occasions: here I shall endeavour to demonstrate how much the trade-wind is beholden to the motion of the sea; and there, in what respect the sea's motion depends on the wind; producing all along some instances for that purpose, in their proper places.

The Motion of the Trade-Wind, and its Dependence on the Course of the Sun.

In the torrid climate of the world, where the sun's motion is swiftest, and his rays perpendicular and more compact, and the sun-burnt earth neither overloads them with moisture, nor any inequality of the sea makes resistance to their operation, his conduct of the wind must be constant and universal, tending diurnally into the west, and annually towards the north and south; and its motion must be pursuant thereto, as long as the obviating coasts and shores will permit the air to move the same way, without any deflection, or impediment of some other kind.

Easterly
winds per-
petual.

To begin with the general trade-wind, which is most constant for motion, and of greatest extent: Dr. Edmund Halley demonstrates, that it necessarily depends on the diurnal course of the sun, in regard the air, which is less rarefied by his heat, and consequently more ponderous, must have motion towards those parts, which are more rarefied and less ponderous, to bring it to an equilibrium: again, the presence of the sun continually shifting to the westward, that part to which the air tends, by reason of the rarefaction made by his greatest meridian heat, is, with him, carried westward, and consequently the tendency of the whole body of the lower air is that way: hence is formed a general easterly wind, which being impressed upon all the air of a vast ocean, the parts impel one the other, and so keep moving till the next return of the sun, whereby so much of the motion as was lost is again restored; and thus the easterly wind is made perpetual.

Why the
winds to the
northward
or south-
ward of the
east.

From the same principles, Dr. Halley tells us, it follows, that this easterly wind should, on the north side of the equator, be to the northward of the east, and, in south latitude, to the southward thereof, while the sun is upon or near the line; the air being there more rarefied, and his motion swifter, than at any distance from it; which motions, by his account, being superadded to the former easterly wind, answer all the phenomena of the general trade-wind.

Trade-
winds more
easterly and
fresher by
the presence
of the sun.

Such is the easterly tendency of the general trade-winds, as also its north and south-easterly inclination, on each side towards the line, while the sun's diurnal motion keeps near the equator, as Dr. Halley has already demonstrated; and when the sun is in the northern hemisphere, and near his greatest declination, then are the winds to the northward of

of the line more easterly, and fresher gales, occasioned by the sun's presence there, and his quick diurnal motion to the westward, the air being there more rarefied, and his motion swifter, than at any distance from him; and wherever the sun is vertical, it generally produces squalls and rain, more or less, according to the situation of the place. Again, when the sun is in the northern hemisphere, then are the winds to the southward of the line more southerly, from the sun's influence over them, drawing the south-east trade-wind even a-cross the line into north latitude: this effect has the sun over the winds between the Coast of Guinea and West-India Islands. And when the sun is in the southern hemisphere, and near the southern tropick, then are the winds to the southward of the equator more easterly, and fresher gales, by the reasons before mentioned, by the sun's presence there; and the winds to the northward of the line are then more northerly from the sun's influence over them, drawing the north-east trade-wind even a-cross the line, into south latitude: this effect has the sun over the winds between the Coast of Brasil and the Coast of Angola: so that twelve degrees, viz. six on each side the line, which geographers commonly assign for the space of tranquillity or calms, is too great, and is removed occasionally by the sun's declination, some times to the northward and others to the southward of the line; and the calms upon the line are most likely to happen when the sun is upon the line, or within a few degrees on either side of it: and, although geographers commonly allow twelve degrees tranquillity, so the sun's tropical declination (being extended, at least, twenty-three degrees) more than doubly sufficeth to draw the said vacuity from one side the line to the other, with an half-yearly vicissitude, as is manifest.

The trade-winds drawn by the sun on both sides the equator.

Calms upon the line.

And again, the wind adhering to the sun's diurnal course, upon its advance to twenty-eight or thirty degrees of either latitude, it blows to the westward perpetually, especially at sea, where no land-impediments fall in its way, either to obstruct or divert it.

Easterly trade-winds perpetual.

Yet, from twenty-eight to thirty degrees of either latitude, there being a space of two degrees tranquillity intermeduating between the said north and south-easterly winds, must needs stagnate into a calm of so considerable a breadth; and this may justly be termed the Shifting Line of the Winds from East to West: which said vacuity of two degrees may be said to hinder the said opposite fluxes of air from approaching each other: hence it is effected, that the same wind which was first carried westerly by the diurnal course of the sun, and now secondly declined, by his annual motion, more north and south, thirdly, is often deflected more obliquely by the inclinations of the shores; and, fourthly, is returned back again, periodically or perpetually, from near the opposite points, by the sea's situation, which is finally (by the concurrence of its flux underneath) carried perpetually quite contrary to the diurnal course of the sun, which first set it on foot.

Shifting line of the winds from east to west.

Which is, that without, or from thirty to fifty degrees of either latitude, there is either a periodical or perpetual westerly wind blowing from south-west to north-west, according to the different seasons of the year, being always influenced by the sun, viz. in the northern hemisphere, when the sun's presence is there, the winds are generally from west to south-west; and, when the sun is absent from that hemisphere, the winds are generally from west to north-west, accompanied with frequent storms, the influence of the sun drawing the winds from the northern into the southern hemisphere after him: such are the winds in the Western Ocean between North America and Europe.

Winds from 30 to 50 deg. of either lat. are westerly.

Winds in the northern hemisphere.

And in the southern hemisphere, when the sun's presence is there, the winds are generally from west to north-west; and, when the sun is absent from that hemisphere, the winds are generally from west to south-west, accompanied with storms and bad weather, the influence of the sun drawing the winds from the southern into the northern hemisphere after him: such are the winds in the Ethiopick Ocean between the Coast of Brasil and Cape of Good Hope, and to the Coast of New Holland, &c.

Winds in the southern hemisphere.

In the aforesaid space, from thirty to fifty degrees of either latitude, the westerly winds are either periodical or perpetual, according to the sea's situation: but, before I proceed to meddle with its shifting motion, as caused by the sun's annual declination towards the poles, it is farther requisite to take along with me this historical relation of matter of fact by Dr. Halley, which I shall strictly observe, and which is as follows, viz.

" In the Indian Ocean the winds are partly general, as in the Ethiopick Ocean partly periodical; that is, half the year they blow one way, and the other half near upon the opposite points: and these points, and times of shifting, are different in different parts of the ocean: the limits of each track of sea, subject to the same change or motion, are certainly very hard to determine; but the diligence (says he) I have used to be rightly informed, and the care I have taken therein, has, in a great measure, surmounted that difficulty; and I am persuaded that the following particulars may be relied on.

" 1st, That between the latitudes of ten degrees and thirty, south, between Madagascar and New Holland, the general trade-wind, about south-east by east, or east south-east, is found to blow all the year long, to all intents and purposes, after the same manner as in the same latitudes in the Ethiopick Sea.

" 2dly, That the aforesaid south-east winds extend to within two degrees of the equator, during the months of May, June, July, &c. to November; at which time, between the south latitudes of three and ten degrees, being near the meridian of the north end of Madagascar, and between two and twelve, south latitude, being near Sumatra and Java, the contrary winds from the north-west, or between the north and west, set in and blow strong, accompanied with dark rainy weather, for half a year, viz. from the beginning of November to April: and this monsoon is observed as far as the Molucca Isles.

" 3dly, That to the northward of two degrees, south latitude, over the whole Arabian or Indian Sea, and Gulph of Bengal, from Sumatra to the Coast of Africa, there is another monsoon, blowing from October to April, upon the north-east points; but in the other half-year, from April to October, upon the opposite points of south-west and west south-west, and that with rather more force than the other, accompanied with dark rainy weather; whereas the north-east blows clear. It is likewise to be noted, that the winds are not so constant, either in strength or point, in the Gulph of Bengal, as they are in the Indian Sea, where a certain and steady gale scarce ever fails: it is also remarkable, that the south-west winds in those seas are generally more southerly on the African side, and more westerly on the Indian.

" 4thly, That, as an appendix to the last-described monsoon, there is a track of sea to the southward of the equator, subject to the same changes of the winds, viz. near the African Coast, between it and the Island Madagascar, or St. Laurence, and from thence northward as far as the line; wherein, from April to October, there is found a constant fresh south, and south south-west wind, which, as you go more northerly, becomes still more and more westerly, so as to fall in with the west south-west winds, mentioned before, in those months of the year, to be certain, to the northward of the equator."

And in the other months of the year, that is, from November to April, in the before-mentioned track of sea, to the southward of the equator, and between Madagascar and the Continent, there are found two very different and opposite winds, viz. from the equator to the north end of Madagascar, the north-east monsoon blows fresh and steady gales: between Madagascar and Mofambique, and as far to the southward as St. Augustine's Bay, or the southern tropick, the winds are from north-west to north and north-east, with frequent storms and dark rainy weather. These winds reach as far as the southern tropick, where they are met by the southerly or south-east winds, which blow at the south end of Madagascar at all times of the year; and they blow very strong at this season of the year. These southerly, or south-east winds, forcing themselves to the northward,

I N T R O D U C T I O N.

ward, between Madagascar and the Continent, and meeting the strong north-east, north, or north-west winds, repel each other with great fury; which occasions terrible storms and tempests. The south-east or southerly winds generally carry it against the northerly winds, especially to the southward of the southern tropick, where the south-east, south, or south-west winds blow all the year long.

And at this season of the year, from October to April, the south and south-east winds mostly prevail from the south end of Madagascar, all along the Coast of Africa, quite to the Cape of Good Hope, where the south-east winds blow very strong and constant at this season of the year: and from the said Cape to St. Helena the south-east winds blow a fresh and steady gale, and thence to the equator, &c.

Of the Shifting Trade-Winds, and their Dependence on the Sun's Zodiacal Declination, with regard to the Equinoctial Position of the Arabian Sea.

So strictly does the mutual concurrence of the north and south-easterly trade-winds observe the equator, while the sun's diurnal motion keeps close to that line: but, when his annual declination withdraws his vertical rays, and the air grows cooler in his absence, the joint concurrence of the said winds (as following close to his greatest meridional heat) must also decline with him into the same latitude, whether it be to the north or south; and those winds must make their half-yearly returns of summer and winter alternately, on each side of the equator.

Besides, the said space of rarefied air, still attending the sun's zodiacal declination successively towards each of the tropicks, and still intermeduating between the said north and south-easterly winds, must needs stagnate into a calm of so considerable a breadth, on each side of that shifting line described by the sun's declination, as to hinder the said opposite flux of air from approaching each other at their congress, that geographers commonly assign it a track of ten degrees tranquillity: so that the sun's tropical declination (being extended at least twenty-three degrees) more than doubly sufficeth to draw the said vacuity from one side of the line to the other, with an half-yearly vicissitude, as is manifest.

Now, the position of the Arabian Gulph, or that part of the Indian Sea which the said shifting north and south-easterly winds chiefly affect, being equinoctial, it concurs very opportunely with the zodiacal motion of the sun, either to remove them all alternately out of that compass, as not exceeding ten degrees on the south of the equator, and twelve degrees to the northward of that line, or, at least, to abate their force in such measure, as not to be able to resist the south and north-westerly monsoons, which of course succeed them from the opposite points every half-year, at their respective seasons, to supply the vacuities left behind them.

Hence it comes to pass, that the north and south-east trade-winds never blow both at once within the compass of the gulph or sea aforesaid, the one being no sooner drawn off by the sun's declination, than the other is brought on again by its own weight, to fill up the vacuity left on the other side of the equator: for so it happens in April, when the sun, having passed the line into the northern signs, at once carries off the north-east trade-wind or monsoon from it, and draws thither the south-east wind after it; which, from the situation of the aforesaid sea or gulph, turns it to south and south-west, and, having repassed it again to the southward, brings those winds back again, and so carries them backward and forward, the one towards the line, and the other frowards it, by an half-yearly vicissitude, for ever.

It is farther observable, that those easterly trade-winds, and westerly monsoons, which happen at the same time, blow jointly either towards the north or south; as from April

to October both blow to the northward, pursuant to the sun's declination into the north signs, drawing them thitherward, from a more dense and ponderous winterly season, into a more expanded and rarefied air of summer; and, on the contrary, they jointly, from October to April, attend in the south on his presence, upon the same occasion: so that the westerly monsoons, inasmuch as they blow north and south, are as effectually influenced by the annual course of the sun, as the easterly trade-winds are to blow hither or thither at the same season.

Hence it comes again to pass, that the said south-easterly winds, as Dr. Halley observes, extend from the aforesaid ten degrees south latitude, near the equator, during the months of May, June, &c. to October, while the sun remains to the northward of the line, to draw them thitherwards; and, on the contrary, that there is blowing a north-east wind for the other half-year, from November to April, the sun being on that side the line to attract it. Now why, or how, those two easterly trade-winds, so intermixing, should each be supplied for its respective half-year by a westerly monsoon from the opposite point, and to assign a cause able to produce so constant an effect, leaves no phenomena of the shifting trade-winds unaccounted for.

How the South and North-Western Monsoons are respectively regulated by the Situation and Figure of the Arabian Sea.

Having shewn already (in the former of the two precedent sections) that the south-easterly wind, which blows perpetually from thirty to ten degrees of the same latitude, is drawn eight degrees nearer the line, on the east side of the Arabian Bay, from April to October, by the sun's declination to the northward; and, in the latter, that the south-west monsoon, by virtue of his said declination, blows to the northward at the same time; let us see how it acquires a westerly turn, by the conduct of the said bay's situation on that side: and it is observable,

First, That the African shores, which coast the ocean towards the west, tend east-northerly from the Cape of Good Hope to Cape Corranter; and from thence it tends north-easterly from Cape Corranter all along to the equator, and beyond it to the bottom of the said bay, the land being high for the most part: and the sea-winds, being a heavy meteor, must consequently as strictly observe their direction, as rivers do the banks which bound them; and the winds must follow their conduct as far as they reach, especially at that season, when a ponderous load of winterly air and foul weather drives them thitherward with more vehemency, as Dr. Halley takes notice, than any other winds that trade in those seas; and it is evident from experience, that in the winter season, whether stormy or otherwise, the winds generally follow the direction of the coast or shores: from the Cape of Good Hope to Cape Corranter it is mostly from west to south-west; and from Cape Corranter to the equator it is mostly south south-west, as the coast or shores lie, strictly observing their direction as before mentioned.

Besides, the said south ocean, whose superficies sustains that south-west wind all the while, sending its tide directly northward towards the said bay, being alike contracted on that side by the inclining shore; the flux of its coasting current must be proportionably hastened, and consequently communicate to the superincumbent south-westerly monsoon a more fixed and steady determination, and drive its flux as deep into the bay as it went before.

In consequence whereto it is observed, that a constant current of the sea, for all that track from Madagascar to the equator, entering the south-west corner of the Indian Ocean, (where the monsoons first begin to shift) carries the superincumbent air along with it down into the Arabian Gulph: and, as Dr. Halley affirms, a constant fresh south-westerly

westerly wind blowing along that coast, on both sides the line, which, the further you go northerly, still blowing more westerly, falls in (says he) with the south-westerly monsoon, or rather gives it a beginning by falling in with it in April, and ending with it in October; which plainly demonstrates, that they compose and become, as it were, the same undiscontinued flood of water and wind conjoined, without any distinction, while the sun's northward declination, at once encourages the south-west wind to blow, and withdraws that north-easterly wind, which otherwise would oppose it. This monsoon blows more southerly on the African Shore, and more westerly on the Indian; and the further to the northward, it still blows more westerly.

Hence it comes to pass, that the south-west monsoon, as being derived from the joint current of wind and water aforesaid, following the south-westerly direction of the African Shore, which still contracts and enforceth it both by land and sea, and having passed the equator, its proper limit, penetrates to the bottom of the Arabian Bay: whereas the south-east trade-wind, which blows at the same time on the south side of the line, never reacheth it, for want of the like assistance from any shore or current, to help it forward; but, on the contrary, falls short of its natural course, at least, two or three degrees, as being repulsed by the contrary motion of the sea and wind, as will appear.

Now, to derive the north-west monsoon regularly from the same source, or current of water, only refluxed, which brought the other monsoon directly from the south-west, it is to be noted, that the bay, wherein they are both propagated, is of a triangular figure, the subtense of whose north angle, pointing directly east and west, separates the said bay, on the south, from the wide ocean, with a barrier composed of isles and shallows, whereon the said south-westerly current falling obliquely, and entering into the gulph at its south-west angle, is reflected from near the corner thereof, towards the other end of the said barrier, where the stream refunds it again, by an easterly outward-bound passage, into the ocean whence it came; drawing the incumbent north-west monsoon after it from October to April, its proper season.

Conformably to the scheme of the south-westerly flux, and north-westerly reflux of the said current, Dr. Halley assures us, that a fresh westerly wind attends it down the bay, which, the further you go northerly, still blows more westerly, till they both approach near the eastern shore, where the current (being now on its return towards the ocean) veers about to the northward, and thence westerly, till it falls in with the conduct of the opposite eastern coast, and follows its direction as far as the Maldiva Islands, which, tending lineally to the same point, steers on its course forward ten degrees further, till it reaches the equator.

Now, in regard the said current, descending into the bay, goes on dispersing its stream into almost calm water, so the opposite eastern shore recollects it again, and revives its motion by the like degrees, till it has passed the said islands up to the line, where it falls in exactly with the tendence of the north-west monsoon: hence it must needs stir up there a motion in the incumbent air of that tendence, the opposite south-east trade-wind being already withdrawn by the sun's declination; and must carry that monsoon, so raised, along with it, according to the same direction, ten degrees further, being its proper limit, till it meets with the said wind to stop it, and the stream underneath, having passed over the aforesaid barrier of isles and shoals, be refunded into the ocean whence it came.

Thus both the westerly monsoons are equally beholden to the same current; that from the southward, as being carried down the Arabian Bay towards the north-east, by its direct course; and this from the northward, as returned back again by its reflux into the south-east, in compliance with the streams underneath; yet with this difference, that whereas the course of the water, meeting no opposite stream to dispute its

its passage, is perpetual; on the contrary, the concomitant fluxes of the westerly monsoons, upon the occurse of the opposing trade-winds, alternately desist, and become periodical; those easterly winds within their compass overpowering all opposition, so as either to restrain the said contrary monsoons, or set them at liberty, while the sun's south or north declination, by half-yearly returns, alternately sets on the said easterly winds, or takes them off again.

Hence it is, that the said south-west monsoon begins to blow in April, when the sun's entrance into the north signs withdraws the opposite north-east trade-wind, which discontinues till October; when the sun, by repassing the line in south latitude, brings it on again: so also the north-west monsoon blows the other half-year, from October till April, from the equator to ten degrees south latitude, and then desists, with regard to the south-east trade-wind, which riseth to countermand it: just as land-breezes, which, following the streams of fresh rivers, are naturally perpetual; nevertheless they are driven back periodically, by the salt floods, till their ebbs give them leave to return again, and blow sea-ward as they did before.

Again, from October to April, notwithstanding the north-east trade-wind has driven back the opposite south-west monsoon, from its adhesion to the direct course of the south-west current, which produceth it; yet, its stream being refluxed, and still retaining its former force and speed, must gradually decline the motion of the incumbent air from the eastward to the westward of the north all the while, till it has repassed the line to the southward, and effectually raised the north-westerly monsoon, having escaped out of the compass of the north-east wind, which would have deflected its course; the south-east wind being also withdrawn by the sun's southerly declination, which otherwise would have opposed and baffled into a calm.

Hence I conclude, that those north and south-easterly winds, which follow the diurnal course of the sun, never blow on both sides of the equator at once; and that that current of the sea, to which I ascribe the contrary south and north-westerly monsoons, serves only, when and where those easterly winds intermit, to determine the motion of the air that way, to supply their respective vacuities till their return; and that those two shifting winds, which blow at once, tend jointly either to north or south, and still towards the sun, that the inequality of their summer's levity and winter's gravity may give force and celerity to their motion, so as, in substance, to be the same north and south winds, but only differently determined on each side of the equator, easterly by the sun's diurnal tendence, and westerly by the current aforesaid.

How the said Shifting Winds are propagated in the Bay or Gulph of Bengal, and the China Seas.

Bay or
Gulph of
Bengal.

Now, forasmuch as the Gulph of Bengal, and Sea of China, are alike affected by the said western monsoon, and at the same time; and all three lie collaterally to each other, and lineally to the same ocean which produced the aforesaid current, the tidal tumour thereof, to render the cause coextensive with its effect, must spread itself comprehensively over them all at once, to produce so general and uniform a commotion in the air: and if that monsoon be not so constant in strength, or point, in the Bay of Bengal, as it is in the Arabian Bay, it is because the ocean, being contracted all along the African Shore, more immediately, and consequently more sharply, affects it, and so must needs give the wind a more fixed and steady determination there, than after it is dilated by a greater expansion.

Beside, the said Gulph or Bay of Bengal being alike of a triangular figure, as well as the Arabian Bay, and they lying respectively in the same horizontal position, the tidal motion

motion of the sea, which, jointly with the aforesaid current, falls into them both with the same obliquity, must equally affect them directly with a south-westerly monsoon, and refluxedly with a north-easterly one: and both lying conjoined and open towards the south, and alike subtended by the barrier aforesaid, on that side, the north-west monsoon, as being jointly directed by them both, must reach coëxtensively along with it, from the eastward of the north end of Madagascar to Sumatra, and from the equator to ten degrees south latitude, as is found by observation.

But as to the Chinese Sea, although it lies on the same side of the Line, and according to the same south-west direction, with open mouth towards the Indian Ocean, to partake of the said south-west monsoon, yet its channel more respecting the north and south points than the bays aforesaid do, its flux of air, as well as of water, must needs deflect the same way: but, it being withal an oblong track of water, and not triangular, beside being a thoroughfare-passage out of one sea into another, it can by no means reflect its stream, either of air or water, back towards the south-east in favour of a north-west monsoon, which is neither found in this sea, nor can be reasonably expected in any other, of different position or figure from the bay and gulph aforesaid.

Now, from what I have already said of this matter, it appears, first, that the place so affected with the monsoons must lie upon or near the equator, to shift them with the sun's declination, both northward and southward, according to the different seasons of the year: hence all seas, of any other position, are incapable of the like alteration.

Besides, the figure of that part of the Indian Ocean which is so affected, must be triangular, with an inlet at its south-west angle, to receive the stream of water which conducts the south-west monsoon into the bay; and an outlet at its south-east corner, to set the north-west monsoon off again by the opposite point, as appears by the special service of every part of the said bay; and how proper it is to perform its office.

It was further requisite, that a barrier, consisting of isles and shoals, should pass between the south-west and south-east passages, to strengthen the aforesaid current (which almost stagnates in the middle of the gulph) into a stream, to stir up the incumbent air into a north-west monsoon; and withal, it was to be of a proportionable breadth to continue its flux over that rampire for six degrees together, into the southerly ocean, to meet the south-east trade-wind, which was to stop it before it ceased.

And this barrier was to be but of a mean stature; neither so high as to hinder the tide or current from passing over it, inasmuch as it might be favourable to both the south and north-west monsoons, by letting the one enter the bay as freely at the west end of it, as the other to go off at the east; nor yet so low as to admit its flood in so full a manner, as to controul or obstruct their shifting motion.

Moreover, the south-western current of wind, which coasteth the African Shore, from near the Isle of Madagascar to the equator; to which Dr. Halley allows a periodical flux from April to October, yet terms it, not improperly, only an appendix of the south-west monsoon, till it hath passed the Line, though it be the origin and sole cause thereof; in regard, till it have passed the equator, it remains out of the sun's power to give it check, and return it whence it came by his southerly declination; especially the concomitant south-west current of the sea, perpetually resisting its trading back again by the same road for the other half year; to wit, from October to April; or at least with any periodical constancy or certainty of motion.

Concerning those Winds, which are adverse to the general Easterly Winds, and are perpetual.

To omit those that blow all the year, without any considerable variation, unless what is subject to be deflected there from some few points of the compass, towards the north or south,

south, according to the position of the place, as being, in all respects, well accounted for by Dr. Halley already, I shall only of course take further notice of these, which he proposeth for exceptions to that general rule, in order to reconcile them to the common laws of motion.

First, That to the northward of the Line, between four and ten degrees of latitude, and between the meridians of Cape Verde, and the easternmost islands that bear that name, Dr. Halley tells us, there is a track of sea, wherein it were improper to say there is any trade-wind, or yet variable.—The little winds that are, be only some sudden uncertain gusts of very little continuance, and less extent, which he assigns to the station which that track holds between two contrary winds; the one on its north side, blowing easterly from the said cape towards Guiana in America; and the other on the south, from Brasil towards Guinea in Africa; which were more proper to turn the interjacent air into a whirlwind than to hold it steady, did not that part of the ocean, where the Atlantick and Ethiopick floods meet, concur to keep it fixed, as being obnoxious neither to flux or reflux to disturb its quiet.

Secondly, That in the track of sea, which (on the south) lies next adjoining to this, the southerly and south-west winds are perpetual, viz. all along the Coast of Guinea, for above five hundred leagues together, from Sierra Leona to the Isle of St. Thomas: for the south-east trade-wind, upon its entrance into the Streights (in compliance with the south-westerly tendence of the sea current along the Brazilian Shore) becomes south, south-east, and by degrees full south; and, being carried down with the stream towards the Guinea Shore, veers about to south-south-west, and by degrees to south-west and west-south-west, under the close conduct both of that stream and coast, till at last the current of water, being repulsed by the eastern shore of Guinea, returns towards the south (whence it came) to make restitution; and, being ingulphed by the tide's detumescency, is carried off by libration thither, and deflects the superincumbent current of air into the south after all, to complete its circulation, as will be farther declared hereafter.

To these, which Dr. Halley alledges, may be subjoined, as remarkable instances of the same truth,

First, That all along the western coast of Peru, for above five hundred leagues together, from near the Magellanic Streights as far as the Gulph of Panama, an uninterrupted and almost perpetual flux of air attends the current of water which supports it, blowing from south to north, or within a point or two to the westward, according to the different inclination of the shore; notwithstanding those exhalations which compose it, fall down from the Andes out of the east, and the western Pacific Ocean lies wide open to receive them, yet without giving even a beginning to an easterly trade-wind, for all that length of shore (till fifty leagues off at sea) which is perceptible.

Secondly, That a perpetual flux of air or wind adheres to the coasting current of the African Shore on the Ethiopick side, from the Cape of Good Hope to near the most southerly part of Guinea, which is constantly determined to blow southerly, by the draught of the stream underneath; and withal, the wind keeps that flux of water on foot, by its constant descent from the adjacent shore, so as both to tend thitherward all the while, by the mutual assistance of each other; with many instances of the same kind, which will be produced more conveniently hereafter.

Such is the adhesion of the incumbent air to the substrate water, when they are got into motion, and have free liberty to follow the same direction; for otherwise each may be put to a stop apart, or both be deflected several ways at once, as the south-west monsoon, which we spoke of before, whilst the south-east wind was withdrawn, passed along the Coast of Africk down into the Arabian Gulph, jointly with the stream that conducted it; and, even after the current had stagnated in the middle of the bay, as soon as it revived

its

its motion towards the south-east, still pursued its refluxed direction: yet no sooner had the south-easterly wind put a stop to its career, and the current reflected towards the north-west, began to revive and gather strength, but the north-west monsoon did so too, and fell in with it, and attended it through the south-easterly passage into the wide ocean, where both ceased together.

By this means these sea-faring winds take the liberty to disorder those which trade out of the east, by the influence of the sun; in some seas stirring them up too soon, and accelerating them above their usual speed, as near Cape Verde; or contracting them some degrees within their common limit, and by and by enlarging them as far beyond it, as all along the Guianean Coast: in others, thwarting them as much by their transverse course from south to north, as on the western shores of Angola and Peru, for a thousand leagues together: in others, blowing directly from the opposite points, as along the southernmost part of Guinea from Sierra Leona to the bottom of the bay; and all this perpetually.

Yet in the Indian Ocean, these sea-bred gales become of so complying a temper, as to yield readily to the periodical insults of its easterly trade-winds, and withal, as respectively to supply all the vacancies left behind them in their absence; which answers the utmost enquiry yet made into the phenomena of winds, owing to the immediate causes of the various and irregular motion of the sea itself, which occasions them.

As I have, in my Description of the Coast of India, given a very particular account of the monsoons in general, both in the Indian and Chinese Seas, and of the wind in general in the Indian Seas as far as the Cape of Good Hope; so I shall here conclude this Treatise of the Winds with one observation more of the winds and monsoons on the Coast of India; That always, when the calms are more frequent than ordinary, then those tempests and hurricanes, usual on the Coast of Coromandel and Sea of China, are to be expected, which so constantly fall at the end of the westerly monsoons, that they are commonly called the breaking-up of the monsoons; so that every where a calm indispensably attends them, generally speaking. This Treatise of the Winds I have the more willingly submitted to publick view, that time and opportunity might, at leisure, adjust mistaken circumstances, and that by the assistance of fresh observations, and the industry of art, the whole theory might, at length, be improved into a common stock of useful knowledge.

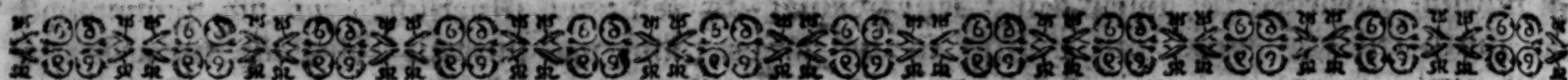


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SUNDRY

S U N D R Y

REMARKS and OBSERVATIONS

M A D E I N

A VOYAGE to the *EAST-INDIES*, &c.

Directions for sailing to India round the Cape of Good Hope; with an Account of the Winds and Currents at different Times of the Year.

*****S all our Directories are deficient in many respects, and not only deficient, but entirely silent with regard to the navigation in the seas about the Cape of Good Hope, (which is a very great omission); why should not the ingenious navigator (when he is about doubling this great Promontory, which formerly was reckoned so dangerous) be made acquainted with the proper seasons of the year for going and coming round this Cape, with the winds, weather, currents, latitude, longitude, and variation of the compass, &c. (which is the navigator's best and surest guide) when and where he is to expect soundings, what latitude it is best to keep in, and what variation he will have when in soundings, with the exact distance from the land, &c. and all necessary directions and cautions for sailing round the Cape of Good Hope?

Being in the vast ocean between the Coast of Africa and Brasil, in the months of May, June, July, or August, which are the months wherein ships generally sail round the Cape of Good Hope, for India, you will meet with fresh gales, and sometimes hard gales, from N. W. to S. W. with a great sea, and showers of sleet, hail, or rain, and the weather pretty cold; the more so as you approach the Cape. About 25 or 26 deg. to the westward of the Cape of Good Hope, you will have 5 deg. W. variation, which you will increase gradually as you run to the eastward, towards the Cape; and, as you come nearer the Cape, the variation increases faster, in proportion, than when you were at a greater distance from the Cape. A good parallel of latitude to run to the eastward in is between 35 and 36 deg. of south latitude.

Winds and weather to W. of the Cape Good Hope.

Variation to the W. of the Cape.

Proper parallel of lat. to run to the

The E. in.

2 Sundry REMARKS and OBSERVATIONS made in

I shall now give you a short account of the winds and weather, at the Cape of Good Hope, every month of the year; with the true latitude and longitude of the Cape; and the variation observed on shore at the Cape, and at sea off the Cape, by several observations.

Winds and weather at the Cape every month of the year. The principal winds, that blow at the Cape of Good Hope, are the S. E. and N. W. the other winds seldom lasting more than a few hours; the E. and N. E. blowing the seldomest of any: the N. and N. W. winds generally bring on foul weather and hurricanes. In May, June, July, and August, the W. and S. W. winds, which are frequently accompanied with fogs and cloudy weather, are soon over; whereas the N. W. winds sometimes blow violently for several days together, in the above months, and sometimes in September, and by fits in other months: the sky is then constantly clouded, and they generally end in rain. The S. E. winds blow at the Cape in most months of the year, but chiefly in October, November, December, January, February, March and April: they are cold and dry, and the sky generally very clear. In March and April they have frequently very thick fogs at the Cape, and along the Coast. As to the general temperature of the air, the Cape is by no means a hot country; though sometimes the heats are excessive, but of short duration: and it rarely freezes in winter, though the nights seem very cold. Thunder is seldom heard near the Cape.

Latitude, longitude, & variation at the Cape. The latitude of the Cape of Good Hope is 34 deg. 24 min. S. and longitude, by astronomical observations, 18 deg. 30 min. E. from London; variation observed a-shore at the Cape, 19 deg. W. variation observed at sea, off the Cape 3 or 4 leagues, 19 deg. 30 min. W. in 1764, by me. I shall not here give a description of the Cape, or directions for sailing into Table Bay, as the time of the year that ships sail round this Cape for India will not admit of their going into Table Bay; but I shall give a particular description of the Cape, and directions for sailing into Table Bay, &c. in their proper place, coming back from India.

Latitude a ship should steer to the eastward in. By a number of journals which I have seen, I know it has been a general practice for ships, passing by the Cape of Good Hope to the eastward, to keep in the parallel of 36 deg. or 36 deg. 10 min. S. which is too high a latitude for a ship to keep in to strike soundings on the Bank off Cape Lagullas; for 36 deg. 10 min. will but just run over the outer edge of the Bank: so that, if a ship should neglect to sound very often, she may run over the Bank without having soundings at all; for in that parallel of latitude the Bank is but narrow, being not more than 25 or 30 leagues broad; and a ship may run that distance in one night's time, and so have no soundings at all. I have heard of some ships that have been so circumstanced, and obliged to proceed on their voyage, without having an opportunity to correct their reckoning; which may be attended with very dangerous consequences.

What parallel of lat. to keep in. I shall now give some necessary remarks, cautions, and directions, for sailing round the Cape of Good Hope; which, I beg leave to assure you, may be depended on. First then, in steering to the eastward, in order to double the Cape, and to strike soundings on the Bank off Cape Lagullas, keep between the parallels of latitude 35 deg. 45 min. and 36 deg. S. and do not go to the southward of 36 deg. and as you run to the eastward you will find the variation increase very fast: I would have you make the variation and latitude your sure guide; for your reckonings will always be a-head of the ship in sailing round the Cape, occasioned by a strong westerly current, which takes its beginning at the south end of Madagascar, and runs to the westward all along the Coast of Africa, to the Cape of Good Hope, where it runs stronger than

Strong westerly current off the Cape. any where else. This strong westerly current setting against the violent W. and N. W. winds, makes monstrous high seas off the Cape; yea, so strong is this westerly current, that it has frequently set ships round the Cape to the westward when they have

Ships set round the Cape by the westerly current.

have least expected it, even when they have been lying-to under a reefed main-fail, or a ballanced-mizen.

Therefore I would earnestly recommend it to the ingenious navigator, to take his Latitude & latitude and variation for his principal and sure guide, which, if carefully observed, he cannot be deceived. variation the best guide.

Being to the westward of the Cape of Good Hope, and steering to the eastward, between the lat. 35 deg. 45 min. and 36 deg. S. if you have increased the variation to 19 deg. W. you must then keep a good look-out, as you are then not far from the Cape; and when you have increased the variation to 19 deg. 30 min. W. supposing the observation good and exact, you are then a-breast of it; that is to say, the Cape bears from N. by E. to N. by W. or thereabouts, of you; and the distance will be your difference of latitude from it. To know when a-breast of the Cape of Good Hope by the variation.

You must continue to steer to the eastward, between the aforefaid parallels of latitude, and you may soon expect to get soundings: the lower latitude you keep in, the sooner you get soundings; so that in lat. 35 deg. 45 min. you will have soundings much sooner than in lat. 36 deg. for the Bank rounds off with a slope to the eastward: and when you have increased the variation to 20 deg.—20 deg. 10 min.—or 20 deg. 12 min. W. in lat. 35 deg. 45 min. 35 deg. 52 min. or 36 deg. S. you will be sure to have soundings at 70, 75, or 80 fathom water, fine gray sand; and Cape Lagullas will then bear off you from N. by W. to N. by E. or nearly N. the difference of latitude will be your distance from the said Cape, which will be about 17, 19, or 22 leagues: Cape Lagullas's latitude, by my own observation, is 34 deg. 54 min. S. and long. (ascertained by our run from the Cape of Good Hope) 20 deg. 15 min. E. from London: the variation, 1764, by several observations off this Cape, I made 20 deg. 2 min. to 20 deg. 12 min. W. Latitude & variation when you'll have soundings off C. Lagullas.

Cape Lagullas bears from the Cape of Good Hope, E. 19 deg. S. or E. by S. $\frac{3}{4}$ S. C. Lagullas' distance 30 leagues: you have soundings all the way between them, in shore, at 40, 50, and 60 fathom sand and ousey ground, sometimes muddy sand. In the above depths you will be from 5 to 10 leagues off shore. The land between these capes is very high, but Cape Lagullas is not high. A description of the land about this Cape, and the coast to the eastward of it, I shall give in its proper place, coming back from India. bearings from Cape Good Hope, The soundings between them.

Suppose you have had soundings off Cape Lagullas, in the latitude, variation, and depth of water above mentioned; suppose the lat. 35 deg. 52 min. variation 20 deg. 12 min. W. the depth of water 75 fathom, fine gray sand, and Cape Lagullas to bear N. of you, distance 19 leagues; all these things we are sure of, and it will answer the same end as if you had seen the land; for were you to see the land, as the weather is generally cloudy and foggy, you could not judge how far you were got to the eastward, without you saw some very remarkable part of the land that you knew; and it would require your being well acquainted with it, to know it well: so that the soundings answer all the ends of seeing the land; and by the soundings you may correct your reckoning, and take a fresh departure. Being sure of the latitude, variation, and soundings, answers the same end as if you had seen the land.

Cape Lagullas is supposed to bear north of you, distance 19 leagues. You may now steer to the eastward, in the parallel of lat. 36 deg. S. In this latitude, and 14 or 15 leagues to the eastward of where you first had soundings, you will have 90 fathom water, brown muddy sand; variation 20 deg. 39 min. W. Hereabouts the variation increases very fast. Fifteen or twenty leagues to the eastward of this, you will have no soundings in lat. 36 deg. S. Soundings in latitude 36 deg. S. soon after, no soundings.

The ships that are bound to China, when they have had soundings off Cape Lagullas, take their departure, and steer for the Islands St. Paul and Amsterdam, and from thence to the Straits of Sunda. The method of making that passage I shall speak of elsewhere. Ships bound to China take their departure.

The

4 Sundry REMARKS and OBSERVATIONS made in

The Inner Passage.

The ships that are bound through the Inner Passage, that is, between Madagascar and the Continent, which is by much the nearest way to India, observe the following directions for making that passage.

How much longitude a ship should make before she goes to the northward of lat. 36 deg. S.

When you have had soundings off of Cape Lagullas, as before mentioned, you steer to the eastward, in the parallel of lat. 36 deg. S. or thereabouts, till you have made long. 12 deg. E. from Cape Lagullas, or rather till you have increased the variation to 25 deg. 52 min. or 26 deg. W. You may then make some northing, but with caution. Hereabouts the strong westerly and N. W. winds, that you had off the Cape, and that have continued with you thus far, begin to moderate, and become variable, and are frequently S. and S. W. and sometimes S. E.

How much before she goes to the northward of latitude 35 deg. S.

Before you go to the northward of 35 deg. S. you should make 15 deg. E. long. from Cape Lagullas, or have 26 deg. 50 min. or 26 deg. 55 min. W. variation; and let the variation be your guide.

Doddington lost.

Consider the shocking account of the loss of the Doddington Indiaman: that day at noon, before she was lost, she was in lat. by observation, 35 deg. S. and had made long. from Cape Lagullas, 12 deg. 50 min. E. They had the winds from S. S. W. to S. S. E. strong gales, with a large sea; and altered their course, at noon, from E. to E. N. E. and run about 70 miles on that course, till about a quarter before 1. A. M. when she struck, and went all to pieces in less than 20 minutes.

Her latitude and longitude.

The Doddington's latitude, by account, when she struck, was 34 deg. 6 min. S. longitude, made from Cape Lagullas, 13 deg. 45 min. E. I make it so by carefully working their run from noon to the time she was lost; and I wish I could know what variation they had, as it would be of great use.

This shocking circumstance, of the loss of the Doddington, and such a number of lives, will make the skilful navigator shudder, and make him rack his invention to point out the cause of such misfortunes, and contrive how to avoid the like accidents happening for the future, by finding proper methods effectually to prevent them.

First cause of the loss of the Doddington.

The first cause that I attribute the loss of the Doddington to is, that their reckoning must have been very much a-head of the ship, occasioned by the current, which runs strong to the westward, all along this part of the Coast of Africa, to the Cape of Good Hope, as I have already mentioned.

Second cause.

The second cause is, that the land is very erroneously laid down in all our draughts, charts, and books, the land lying much more to the southward and eastward than is laid down; and all the charts make it trench away to the northward too quick; which is a very great error, as it deceives and misleads the navigator, making him haul to the northward too soon, which runs him into danger; whereas he should keep more to the eastward to avoid it.

Third cause.

The third cause is, that the Doddington made her course too much northerly: she steered E. N. E. and must at least have had 25 deg. W. variation, which is $2\frac{1}{4}$ points, with a great sea from the southward: so that she could not make her course better than N. E. $\frac{1}{2}$ N. which was too northerly a course, had she been 2 deg. of longitude to the eastward of where she was by her reckoning.

Where the Doddington was lost.

However, I think the Doddington's reckoning must have been very erroneous; for they had made longitude to where the ship was lost 13 deg. 45 min. from Cape Lagullas; and where the ship was lost is not more than 8 deg. to the eastward of the said Cape.

The Doddington, a caution to navigators.

I wish I could know what variation they had; for I look upon the variation hereabouts, as well as several other parts, to be a principal and sure guide in navigation: however, this unfortunate ship should be a caution for all navigators to be very cautious, and not to haul to the northward too soon; for the currents are very deceiving. I have

have been told by a very old and experienced commander in the India service, that, one outward-bound passage, he was by his reckoning looking out for Madagascar, and made Cape Corrantes; so deceiving are the currents, which almost always set to the westward; but you seldom or ever hear of their setting to the eastward.

It appears, by the account of the people that were saved out of the Doddington, that she was not the only ship that had been cast away on that island; for they saw the remains of the wreck of several other ships, that had been lost there; no doubt, by the same cause that she was lost.

Several wrecks seen where the Doddington was lost.

I have had the perusal of several journals, and have discoursed several experienced navigators on the navigation between Cape Lagullas and Madagascar; whereby it appears, that ships in general make 24 deg. of long. from Cape Lagullas to St. Augustine's Bay, on the island Madagascar, or the land in lat. 24 deg. S. which is the place ships should fall in with. Now, as there are 24 deg. of long. between Cape Lagullas and Madagascar, why should ships haul to the northward when they have not made more than half that

The difference of long. between Cape Lagullas and Madagascar.

longitude, and run the risk of falling in with the coast unexpectedly, (which is frequently a lee shore, by the winds blowing mostly southerly, or from S. E. to S. W. with strong gales, a great sea, and often hazey weather; all disagreeable circumstances to be upon a lee shore with) when it may be avoided by the following method? viz. When a ship in the lat. of 35 deg. S. has made 15 deg. E. long. and has increased her variation to 26 deg. 50 min. or 26 deg. 55 min. W. as before mentioned, she may haul to the northward with safety, and make her course E. N. E. then N. E. and by degrees more northerly: thereby you will continue the variation from 26 deg. 55 min. to 26 deg. 43 min. till you get into lat. 31 deg. S. and make from Cape Lagullas about 18 deg. E. long. From hence the variation will decrease faster as you run more to the northward. In lat. 25 deg. 19 min. S. and longitude, made from Cape Lagullas, 20 deg. 4 min. E. you will have variation 25 deg. 10 min. and 25 deg. 4 min. W. In lat. 24 deg. 3 min. S. and longitude, made from Cape Lagullas, 23 deg. 20 min. E. you will have variation 25 deg. This is not far from the land of Madagascar: and here I would advise a ship to keep to the southward of 22 deg. 30 min. S. in order to shun the dangerous shoals of the Bassas de India.

When a ship may haul to the northward.

The Bassas de India is a most dangerous shoal; in length 5 or 6 miles, and very near as broad: it is even with the surface of the water, consisting of some dry spots of sand and rocks, there being nothing higher upon it than a high catamaran under sail: several parts of this shoal have the resemblance of an Indian catamaran under sail; there are breakers every where about them; and they cannot be seen from a ship's deck above 5 or 6 miles, or from the mast-head above 9 or 10 miles. There are no soundings within 3 miles of them.

Description of Bassas de India.

This shoal was seen by his Majesty's ship Norfolk, in January, 1764, in her return from India, who first made Cape St. Sebastian on the Continent, in lat. 22 deg. 41 min. S. and long. from London (by my computation) 36 deg. 32 min. E. Cape St. Sebastian is tolerable high land; about as high as the land of the Start Point in England, and projects but a little way out into the sea. When you are off this Cape, it appears higher land than any other in sight, either to the northward or southward of it, and has no soundings within 3 miles of it. The coast all hereabouts is tolerable high land, with a steep white sandy beach, which, at a distance, appears like chalk cliffs.

Cape St. Sebastian.

The Norfolk had the winds southerly, and took her departure from Cape St. Sebastian, when steering to the eastward, the 3d day at noon had a very good observation, and at 3. P. M. made the Bassas de India, in the N. E. of them, which obliged them to tack: they were within 3 miles of them, and had no soundings. They make this shoal to lie in lat. 21 deg. 45 min. S. and in longitude, to the eastward of Cape St. Sebastian, 4 deg. 20 min. E. They then stood to the westward, and made Cape Corrantes; and 5 deg. 10 min.

The Bassas de India seen.

Their lat. and long.

6 *Sundry* REMARKS and OBSERVATIONS made in

Cape Cor-
rantes.

10 min. W. long. from the Bassas to the said Cape. C. Corrantes is also tolerable high land, and has much the same appearance as the land about Cape St. Sebastian. Cape Corrantes lies in lat. 23 deg. 42 min. S. and longitude, by computation, 36 deg. 40 min. E. from London. This Cape, and the land about it, may be seen, in clear weather, 9, 10, or 11 leagues, and appears to be as bold a shore as that about Cape St. Sebastian.

	D.	M.	
Allowing Cape St. Sebastian to lie in longitude, from London, - - -	36	32	E.
The longitude the Norfolk made from C. St. Sebastian to Bassas de India	4	20	E.

The longitude of Bassas de India, - - - - -	40	52	E.
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The longitude of Sandy Island, at St. Augustine's Bay, from London, -	44	15	E.
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The longitude of Bassas de India, - - - - -	40	52	E.
---	----	----	----

The Bassas de India lies - - - - -	3	23	West
------------------------------------	---	----	------

of Sandy Island, at St. Augustine's Bay.

How ships
go through
this passage
without
making the
land.

I have often been surprized how ships could blunder through, between Madagascar and the Continent, without endeavouring to make the land, when there are so many shoals and dangers lying in their way, and when there is the greatest probability of their reckoning being very incorrect. By several journals I have observed, that in going through this passage they have unexpectedly fell in with this or t'other shoal, and narrowly escaped being lost, when they might with ease and safety have made the Continent, either about C. Corrantes, or C. St. Sebastian, and from thence taken a fresh departure. If they were not inclined to make Madagascar about St. Augustine's Bay, which sometimes perhaps they may be forbid to do, they might then either make the Continent as above mentioned, or the south part of Madagascar, about St. John's, in lat. 25 deg. 30 min. S. or thereabouts, and so take a fresh departure, &c. If forbid to stop at St. Augustine's Bay, I would advise you to make the land of Madagascar in the lat. 24 deg. 10 min. or 24 deg. S. being a pretty clear part of the Coast, and not far from St. Augustine's Bay. Or a ship may steer for Madagascar, in lat. 17 deg. 40 min. S. until she gets soundings upon the Precellas Bank from 30 to 15 fathom: on this Bank the soundings are very irregular; but keep in 20 fathom is a good depth till you lose soundings; then steering N. E. by N. will carry you in sight of Joanna. The land in lat. 24 deg. S. is but low near the sea, but rises gradually in land to a tolerable height, and may be seen from a ship's mast-head 9 or 10 leagues, and from the deck 6 leagues.

In what lat.
to make Ma-
dagascar.

The land
made in lat.
24 deg. S.

I have made the land in lat. 24 deg. S. and longitude, made from Cape Lagullas, 23 deg. 55 min. E. variation 22 deg. 21 min. W. There were eight sail in company, who all made the variation 22 deg. W. founded, and had 50 fathom water, coarse yellow sand; 3 leagues off shore. The longitude of the land, in lat. 24 deg. S. by computation, is 44 deg. 20 min. E. from London.

The coast
from lat.
24 deg. S. to
St. Augus-
tine's Bay.

The Coast from lat. 24 deg. S. to St. Augustine's Bay, lies north and south by compass, without reckoning the variation, distance 6 or 7 leagues. There is a reef lying along parallel to the shore, N. and S. distance from the shore 2 or 3 miles, which the sea breaks upon in most places, but is very smooth within it. Between the lat. 24 deg. S. and St. Augustine's Bay I made the variation 23 deg. W.

The high
land about
St. Augus-
tine's Bay.

Before you come as far to the northward as St. Augustine's Bay, or Sandy Island, you will see the high land about St. Augustine's Bay, which is pretty high land near the sea, but much higher at some distance in land: there is one hill on the north side the Bay, which much resembles the roof of Westminster Hall; wherefore navigators have called it Westminster-Hall. This hill lies a long way in the country, and bears from you, when at anchor in the Bay, N. E. $\frac{1}{2}$ N.

As

As you sail to the northward you will raise a small low island, with some low trees and shrubs on it, and a very white sandy beach, which is called Sandy Island; and there is a ledge of rocks lies off N. W. from this island a large half-mile, with foul ground and breakers all round it, some distance from it. This island lies near the south side of St. Augustine's Bay, at the westernmost part thereof, and is, in lat. by my own observation, 23 deg. 42 min. S. and long. by the most exact computation, 44 deg. 15 min. E. from London; variation 23 deg. 57 min. W. You have very deep water all about this part of the Coast. Sandy Island, E. by N. $\frac{1}{2}$ N. distance 5 or 6 miles, I have had 160 fathom, rocky ground. In sailing in for St. Augustine's Bay you must go to the northward of Sandy Island, and borrow upon it to avoid the shoals on the north side the Bay, being rocks under water, on which the sea breaks in stormy weather, bearing from the Tent Rock N. $\frac{1}{2}$ W. by N. ^{Rocks on the N. side the Bay.}

You will have no soundings till Sandy Island bears S. by E. or S. of you: you may borrow upon the island to 12 or 13 fathom water; and passing it in that depth, you will continue soundings for about a mile from 12 to 15 and 16 fathom, and then no soundings. ^{When you will have soundings.}

After this you must not expect to get soundings with your hand-line till you come on the bank, off the Tent Rock; at least, I would not advise a ship to go into so little water, as to get ground with the hand-line; for in 12 and 14 fathom water, you will not be more, in some places, than 3 or 4 ships lengths from a reef that lies parallel to the southern shore, and about half a mile from it. ^{A reef off the southern shore.}

Directions for sailing into St. Augustine's Bay.

Having passed Sandy Island in 12 or 13 fathom water, and you are steering to the eastward for St. Augustine's Bay, you will see high land, close to the sea, on the south side the Bay, and also high land some distance in the country; and the mouth or entrance of the river will be open to you, which serves as a leading mark to run up to the bay, and carries you clear of the reef, and all danger.

The north point of the river is a steep bluff point: the south point of the river is also a steep point, with a low woody point running out to the northward from the steep part thereof: these points are a good leading mark, viz. keep the high bluff point on the north side the river, a sail's breadth open, with the low woody point on the south side of the river; when the bluff point on the north side the river will bear E. $\frac{1}{2}$ S. ^{The leading mark up the Bay.}

As you run to the eastward, after you lose soundings from Sandy Island, you will have no soundings till you come off the first low sandy point on the southern shore; off which point there is a shoal runs out a small distance, on which the sea breaks: there is 9 and 10 fathom close to the breakers, and 14 or 15 fathom two cables length without them; and it deepens gradually from 14 to 28 fathom, $\frac{3}{4}$ of a mile to the northward of this point; and then no soundings. Note, the leading mark must be kept a large sail's breadth open in passing these breakers, which you should pass in 14 or 15 fathom. As the wind generally blows off the southern shore, the leading mark will carry you up along the back of the reef. From this point to the Tent Rock there is a reef that lies parallel to the shore, and a large half-mile distance from it, which dries at low water, but is entirely covered at half-tide; and there are two rocks almost at the east part of this reef, which are always seen, unless at high water on spring-tides. At $\frac{3}{4}$ flood or $\frac{1}{4}$ ebb they appear like two small boats or canoes. About half way between these rocks, and the low sandy point, where the breakers are, there is a swatch in the reef, having 16 or 17 fathom close thereunto, which may be apt to mislead people that are not acquainted with it, and go by their soundings. ^{Soundings off the low sandy point, on the southern shore. The reef. Two rocks. Swatch in the reef.}

At

8 *Sundry* REMARKS and OBSERVATIONS made in

Not to trust to the hand-lead and line.

At high-water time, when this reef is covered, and a ship coming in, not acquainted with the place, having no soundings with the hand-lead, hauls in towards the shore, in order to get soundings, she may thereby run bump upon the reef, before they have any soundings with the hand-line. I have known those that thought themselves well acquainted with this place commit this error: lucky for them, it was flowing water, by which they got off, though with the loss of their fore foot and part of their keel; and narrowly escaped being lost.

The leading marks, with the soundings.

But observe the leading marks to keep them a sail's breadth open, and you will pass this swatch in 21 fathom water: two cables length further out you will have 34 fathom; then no soundings.

No soundings.

Between the swatch of the reef, and the two rocks that appear at $\frac{3}{4}$ tide, you will have no soundings at 70 fathom, with the leading marks a sail's breadth open; for here the reef is steep too.

Soundings off the two rocks.

Steering on to the eastward with the leading marks, as before mentioned, you will have soundings 29 and 30 fathom, when you come a-breast off the two rocks, that appear at $\frac{3}{4}$ tide. There is 12 fathom within three ships length off these rocks, and 20 fathom a small cable's length without them; 30 fathom N. $\frac{1}{2}$ E. from them, and three cables length without them, the leading mark as before mentioned; a little without that 32 fathom, and then no soundings.

When the regular soundings begin on the bank.

Steer to the eastward with the points of the river a sail's breadth open, (the north point of the river will then bear E. $\frac{1}{2}$ S.) till you bring Westminster-Hall with a low sandy point on the north side of the bay, when it will bear N. E. $\frac{1}{2}$ N. Then begin the regular soundings on the bank; and you will be past, or a little to the eastward of the two rocks that show at $\frac{3}{4}$ tide; and they will then bear S. W. of you, and you will have 26 fathom water; and now you may bring the points of the river in one, or shut them in with each other, without danger. You shoalen the water gradually from 26, 21, 18, 15, 12, 11, 10, to 9 fathom. There is good anchoring in from 8 to 12 fathom, the Tent Rock bearing from S. $\frac{1}{2}$ E. to S. $\frac{1}{2}$ W.

Gradual soundings on the bank.

Marks for the best anchorage.

But there are other marks for anchoring, viz. Observe that, from the low woody point on the south side the river, some distance from this point, the land rises up to a steep bluff, something like the bluff point on the north side of the river, but much higher: bring those two bluff points in one, or touching, or a little shut in; and the Tent Rock from S. $\frac{1}{2}$ E. to S. $\frac{1}{2}$ W. is the best anchoring: with these bearings you will have from 10 to 12 fathom water, clear and good holding ground; and Westminster-Hall will bear about N. E. $\frac{1}{2}$ N. or you may go nearer the Tent Rock, in 8 or 9 fathom water, and have a very good birth, with good holding ground, clay and mud.

To moor.

Here you should moor east and west, that you may ride between the tow, and with an open hawse, when the wind comes to the northward, and blows hard, which it sometimes does: should you moor north and south, in some places your outer anchor would lie in very deep water.

The broadest part of the bank.

The broadest part of this bank is with the Tent Rock bearing S. $\frac{1}{2}$ E. You will have soundings $\frac{2}{3}$ of the bay over, from the Tent Rock, with the steep points of the river open and shut, or touching: 11 or 12 fathom, to 16, 17, 19, 21, 21 $\frac{1}{2}$, 24 $\frac{1}{2}$, 27, 29, 33, 40 fathom, with the bluff point on the north side the river, E. by S. $\frac{1}{4}$ S. and the Tent Rock S. $\frac{1}{2}$ E. without this no soundings.

What depth to anchor in

No ship should let go an anchor in more than 15 or 16 fathom, unless it is with the Tent Rock bearing S. $\frac{1}{2}$ E. and then in not more than 18 or 20 fathom; for the bank goes off very suddenly in most places, from 20 or 24 fathom, to no soundings. The Tent Rock bearing from S. $\frac{1}{2}$ E. to S. $\frac{1}{2}$ W. in from 8 to 12 fathom water, is the best place for a ship to lie in; for there is good ground and most drift.

Here

Here you may get wood and water. You water in the river; at the mouth of which there is a bar, with only two feet at low water. It flows here at full and change, N. E. by N. and S. W. by S. or 2 $\frac{1}{4}$ hours; and it flows perpendicular 8 feet at spring-tides. Here you get plenty of good beef, mutton, and fowls, and other refreshments, at reasonable rates. The inhabitants are civil, but, if affronted, are of a revengeful disposition: they are great beggars, and will over-reach you in trade if they can, and are a little inclined to thieving, &c. Vegetables are very scarce at this place. The latitude of this Bay is 23 deg. 34 min. S. and longitude, by computation from the Cape of Good Hope, 44 deg. 25 min. E. from London; variation 23 deg. 55 min. in 1762.

Of the Seasons, Winds, Weather, &c. about St. Augustine's Bay, and between Madagascar and the Continent, in all the Months of the Year.

All the west side of Madagascar, between it and the Continent, from Cape Corrantes to Mosambique, is what may very properly be called a Gulph, on account of the variableness of the winds, the uncertainty of the weather, and the sudden storms that frequently happen there at all times of the year, but most so in the N. E. monsoon.

In the S. W. monsoon, or the fair-weather season, which is from April to the beginning or middle of November, the weather is mostly moderate and fair, the winds chiefly from S. W. to S. E. In shore you have sea and land breezes; but the winds in the offing are often variable, and frequently northerly; and, if you have a storm in those months, it is either at N. W. or S. E. I have rid out a smart gale of wind at N. W. and N. N. W. in St. Augustine's Bay, in August, which threw a great sea into the Bay; and the sea broke very high on the shoals without; and it very frequently blows hard at S. E. and E. S. E. though this is the fair-weather season: and during all this season you generally find a southerly current all along the Coast of Madagascar; though sometimes it sets to the northward, but very seldom.

In the beginning of November the N. E. monsoon sets in at the Island Joanna and the islands adjacent, and the north part of Madagascar; and the said monsoon sets in at St. Augustine's Bay about the middle or towards the latter end, of November; after which time it is dangerous lying in St. Augustine's Bay; for, though it is called the N. E. monsoon, the wind is often at N. and N. W. which blows right into the Bay, and throws in so great a sea, as makes it dangerous for ships to lie there.

This N. E. monsoon seldom reaches much beyond St. Augustine's Bay, unless by chance, now and then, when the winds are variable and it is inclined to stormy weather; for the S. E. winds mostly prevail about the south end of Madagascar at all times of the year; and at this time of the year, that is, the latter end of November, December, January, and February, these S. E. winds blow very strong; and the wind is often S. and S. W. with squalls and rain. These S. E. and southerly winds, forcing themselves to the northward, and meeting the strong N. E. N. or N. W. winds, repel each other with great fury; which occasions terrible storms and tempests, the winds flying about like a whirlwind, the sky dark and cloudy, with a deluge of rain, and a most confused sea. In the N. E. monsoon, the northerly winds generally prevail as far to the southward as the southern tropick, and sometimes not so far, but only to lat. 21 or 22 deg. S. where they are met by the S. E. or southerly winds, which generally carry it against the northerly winds, especially to the southward of the southern tropick. This bad-weather season continues from November to the middle or latter end of March; which makes me compare those seas between Madagascar and the Continent to a gulph; and I would call it the Gulph of Madagascar, on account of the sudden storms and changeableness of the winds and weather.

Winds and weather in the S. W. monsoon.

Setting in of the N. E. monsoon.

Dangerous lying in St. Augustine's Bay.

How far the N. E. monsoon reaches

The winds meeting, occasion storms and tempests.

10 *Sundry* REMARKS and OBSERVATIONS made in

Of the set
of the cur-
rents.

During the N. E. monsoon the current generally runs strong to the southward and south-westward, near the Continent, so as to set a ship 20 or 25 miles in 24 hours, as I have experienced for several days together: and at the same time it runs as strong to the northward, near the Coast of Madagascar. At this time of the year you will find your ship much to the westward of the reckoning, occasioned by the current, which sets strong to the southward and south-westward.

Difference
between the
monsoons.

This is the difference between the monsoons: in this Gulph of Madagascar the N. E. monsoon seldom blows farther than the southern tropick, where it is met by the S. E. S. or S. W. winds, which repel it; but the S. W. monsoon blows quite through between Madagascar and the Continent, and into the Indian Seas, where it turns more westerly, the further you go to the northward; although, even in the S. W. monsoon, between Madagascar and the Continent, there are frequent revolutions of the winds: it is sometimes variable, and frequently northerly, as I have before mentioned; but the winds in general are mostly southerly, or from S. E. to S. and S. W.

Ships to take
their depart-
ure from
Sandy Island

I have seen by several journals, that when ships sail from Madagascar, or St. Augustine's Bay, they take their departure from Westminster-Hall, which is a hill a long way in the country, and therefore a very improper place to take your departure from, as neither the latitude nor longitude of it is ascertained. I think Sandy Island, on the south side of St. Augustine's Bay, a much properer place, as it lies parallel with the Coast; and I have ascertained its latitude and longitude with great exactness, viz. its lat. 23 deg. 42 min. S. and long. 44 deg. 15 min. E. from London.

What long.
a ship should
make from
Sandy Island
before she
sails to the
northward.

When ships sail from St. Augustine's Bay, for India, they generally run to the westward, and make 50 or 52 min. W. long. from Sandy Island, and then make their course due north: they do this to keep clear of the Coast of Madagascar, which is all foul ground, with several shoals lying some distance off the Coast, all the way to the northward from St. Augustine's Bay, to Cape St. Andrea, in lat. 15 deg. 50 min. S. and to shun a rock which is laid down in the India Pilot, and other draughts, in lat. 21 deg. 27 min. S. When you have made 52 or 50 min. W. long. from Sandy Island, a north course carries you clear along the Coast, to the eastward of the above-mentioned rock, and clear of all danger.

In what lat.
you meet
with found-
ings.

I have seen the land of Madagascar, from the mast-head, in lat. 22 deg. S. and long. made from Sandy Island, 1 deg. W. the variation 22 deg. 42 min. W. and had no soundings; nor will you have any till you come into lat. 17 deg. 32 min. S. In sailing along this part of the Coast of Madagascar, you will generally find a southerly current, setting from 10 to 15 and 20 miles, to the southward, in 24 hours; though it sometimes sets as much to the northward.

Of the cur-
rent.

In what lat.
to make your
course more
easterly.

Before you come into lat. 18 deg. S. or thereabouts, take care to keep more to the eastward, so as to reduce your longitude, made from Sandy Island, to 30 min. W. or thereabouts, in order to keep to the eastward of St. Christopher's; the latitude and longitude of which I have endeavoured to ascertain by ships journals, that have seen this Island; though they have not been so particular in their remarks as I could have wished.

St. Christo-
pher's.

By their journals I make the latitude of St. Christopher's to be 17 deg. 27 min. S. and longitude 44 or 46 min. W. from Sandy Island, at St. Augustine's Bay. St. Christopher's is a small, low, bare Island, with few breakers about it. The variation off this island, 21 deg. 44 min. W. 1756.

Soundings
between 17
deg. 32 min.
and 17 deg.
14 min. S.

In lat. 17 deg. 32 min. S. long. made from Sandy Island, 30 min. W. the variation 20 deg. 50 min. W. I have had soundings at 26 and 27 fathom water, then 30 fathom, coarse brown sand: continued soundings from lat. 17 deg. 32 min. to 17 deg. 14 min. S. but very irregular, as from 25 to 30, 18, 14, 25, 16, 20, 27, 25, fathom; and then no soundings at 60 fathom.

A VOYAGE to the EAST-INDIES,

11

In lat. 16 deg. 40 min. S. and long. made from Sandy Island, 25 min. W. the variation 20 deg. 42 min. W. or hereabouts, you ought to keep to the eastward, and to make your course N. by E. to avoid a dangerous shoal, seen by three Indiamen, (the Chesterfield, Walpole, and Hector) in August, 1756, an account whereof I shall here give you, taken out of the Chesterfield's log-book.

A dangerous shoal seen by 3 Indiamen.

"At 5. A. M. saw breakers from the mast-head, right a-head of us; hauled our wind, in order to go to the westward of them, though I perceived the passage good to the eastward: the Walpole and Hector did the same, and, I believe, were nearer to them than we, though we were not half a cable's length from the White Heads. This shoal appears to be a mile long, and half a mile broad, and lies near E. and W. There is on it one small rock, that is dry, and a little to the eastward of that rock, a patch of redish sand, that is dry also; against which the sea broke furiously, though moderate weather: and there was a confused sea where the ship went through."

The Chesterfield's account of it.

They had 30 fathom water when they first saw the shoal, and were steering N. E. The breakers were then right a-head of them: then they had 19, 20, 12, 10 $\frac{1}{2}$, 7, and 6 fathom. They past them in 6 fathom, within half a cable's length of the breakers: then 7 $\frac{1}{2}$, 12, and 25 fathom, 2 or 3 leagues to the westward of the shoal: then no soundings at 40 fathom.

Soundings near it.

At noon they were in latitude, by observation, 15 deg. 59 min. S. and longitude, made from Westminster-Hall, 58 min. W. they experienced a northerly current, which set the ship 12 miles to the northward of the reckoning.

Their lat. at noon.

I have carefully worked the course and distance from 5. A. M. to noon, with an allowance for the north current, and make the course W. 36 deg. N. distance 24 miles from the breakers on the shoal; by which I make the shoal to lie in lat. 16 deg. 13 min. S. and longitude, from Westminster-Hall, 38 min. W.

Lat. & long. of the shoal.

They saw the Island St. Christopher's, at 6. P. M. the evening before, bearing east, distance 2 or 3 leagues: I have carefully worked their course and distance from St. Christopher's, with the bearings of it, at 6. P. M. and made allowance for the northerly current; by which I make the shoal they saw, which I call the Chesterfield Shoal, to lie from St. Christopher's N. 5 deg. E. distance 72 miles, or 24 leagues. This shoal is not laid down in any map, book, or chart, I ever saw; and should be carefully avoided.

Bearings thereof from St. Christopher's.

Your longitude, made from Sandy Island, in lat. 16 deg. 20 min. S. should not be more than 12 min. W. the variation 20 deg. 5 min. W.

From this latitude you may make your longitude easterly; so that in lat. 13 deg. 12 min. S. you may have made 50 min. E. long. from Sandy Island: variation 19 deg. 30 min. W. in which latitude, longitude, and variation, if the weather is clear, you will see the Island Mayetto, bearing about east of you, distance 8 or 9 leagues. This Island is high land, and has a high remarkable peak on the south side of it, which you may see at the above-mentioned distance.

When you may make your long. easterly.

Hereabouts you will find a strong southerly current, which will set the ship from 20 to 24 miles to the southward in 24 hours. Make your course N. N. E. 4 or 5 leagues, and you will see the Island Joanna bearing about N. N. E. or N. N. E. $\frac{1}{2}$ E. distance 11 or 12 leagues, it being very high land, much higher than either Mayetto or Mohilla, with a very high peak in the middle; and then Mayetto will bear E. by S. You have no soundings hereabouts.

A strong southerly current.

Steer for the west part of Joanna, and you will soon see the Island Mohilla, which is also a high island: you will see it to the N. W. of you. Ships always go between Joanna and Mohilla; and go within 2 or 3 miles of the west part of Joanna, and so to the eastward of Angazecha, or Great Comero, there being a small island to the northward of this,

The common passage between the Comero Islands.

in

12 *Sundry REMARKS and OBSERVATIONS made in*

in lat. 10 deg. 30 min. S. called Little Comero. See the Description of the Comero Islands, &c. below. If bound into Joanna, observe the following

Remarks and Directions for going into Joanna Road.

Directions
for going
into Joanna.

There is a reef lies off the S. W. and W. parts of this Island, at some distance from the shore, which you will see as you come near it: this reef runs to the west point of the Island, and joins to a small island with a saddle in the middle of it, commonly called Saddle Island, which lies a small distance off the west point of Joanna. You may steer for this Island, and round it, at about half a mile's distance, in 10 fathom water: the water there appears as if a shoal; but you have no reason to be afraid; keep in 10 or 11 fathom water, no danger.

The Bay
and Road.

As soon as you are a-breast of the Saddle Island, you will open the Bay and Road of Joanna; then haul up to the eastward, and keep the western shore aboard, if you can. You will find the winds variable and squally, and drawn by the valleys: be cautious in carrying much sails, for the squalls, out of the Bay, are sudden and heavy. You may round the Bay by keeping in 25 fathom water, about a mile from the shore, till you bring the church S. E. $\frac{1}{2}$ E. and then you may anchor.

The marks
for anchor-
ing and
watering.

But you will be very lucky if you are not obliged to make several tacks, before you get into anchoring ground. When the church bears S. E. $\frac{1}{2}$ E. and the west point of the Bay W. by N. and the east point N. E. $\frac{1}{2}$ N. then you are right a-breast of the watering place; and you may anchor with these bearings, in 25 or 20 fathom water. You may carry out your kedge or stream anchor, and haul in shore, so as to raft your cask off with the studding-sail, halliers, &c.

There is another watering-place, that comes through the first Toddy Tope, to the eastward of the town; for which bring the church S. E. by S.

Fresh pro-
visions and
refresh-
ments.

Here you get plenty of good water; but wood is rather a scarce article: here is also plenty of fresh provisions and other refreshments, such as beef, goats, fowls, lemons, oranges, cocoa nuts, &c. at a cheap rate. The inhabitants are Mahometans, and are a civil, courteous people, and ready to help strangers: the Island is pleasant and healthy, though very high and mountainous. The N. E. monsoon comes on, or sets in at Joanna,

When the
N. E. mon-
soon sets in.

and the Islands adjacent, about the 10th or 16th of November, when it is dangerous for a ship to lie in Joanna Road.

A Description of the Comero Islands, as they are properly called; with their Latitude, Longitude, Bearings and Distance from each other; and the Variation of the Compass, &c.

A descrip-
tion of the
Comero
Islands.

These Islands take their name from the Island Comero, the largest of them; and are called the Comero Islands, being all very high and mountainous; but Comero the largest and highest of them all. These Islands are four in number, viz. Comero, Joanna, Mayetto, and Mohilla: their latitude, longitude, bearings, and distance from each other, are as follow:

Their lati-
tude, longi-
tude, bear-
ings, and
distance
from each
other.

Joanna's lat. 12 deg. 11 min. S. and longitude, from London, 45 deg. 5 min. E. Comero bears from Joanna W. N. W. distance 26 leagues, but from land to land only 22 leagues. Comero's lat. 11 deg. 40 min. S. and long. 43 deg. 52 min. E. Mayetto bears from Joanna E. S. E. $\frac{3}{4}$ S. distance 23 leagues, but from land to land not more than 10 or 11 leagues: its lat. 13 deg. 10 min. S. and long. 45 deg. 38 min. E. This Island has a high remarkable peak on the south part of it. Mohilla bears from Joanna W. by S. $\frac{1}{4}$ S. distance 14 leagues, but from land to land not more than 11 or 12 leagues: its lat. 12 deg. 20 min. S. and long. 44 deg. 26 min. E. Mohilla bears from Comero, S. E. $\frac{1}{2}$ S.

S. E. $\frac{1}{2}$ S. distance 17 leagues; but from land to land not more than 8 or 9 leagues. The variation amongst these Islands was 18 deg. 42 min. W. in 1762. These Islands, being very high, are seen a great way at sea in clear weather.

Amongst these Islands, in the S. W. monsoon, you generally meet with little winds, variable and calm; and you will generally find a strong current setting to the south-westward. I have had a spirt of wind that has run me from Joanna to the N. E. part of Comero, and then have been becalmed, and drove with the current, to the S. W. of Comero. Many ships have been drove so by the current in calm weather. The S. W. monsoon.

I must here take notice of the mistaken notion, that people in general have of the natives of the Island Comero, owing to the account the English Pilot gives of them, that they are subtle, bloody savages, which, he says, is the reason that Island is not frequented: but it is an arrant mistake; for I have been told by several people, who have been ashore there, while lying becalmed off the Island, that they were very civilly received by the inhabitants, who gave them plenty of fruit, and such as the Island afforded; and seemed much inclined to encourage strangers to come amongst them. This Island abounds with fresh provisions, and refreshments, in as great plenty as at Joanna; and the inhabitants are as civil; so that I apprehend the only reason why it is not frequented is, that there is no good road or bay, that we know of, where ships can lie safely at anchor. A mistaken notion about Comero.

When ships have completed their water, &c. at Joanna, they sail to the northward for India, and take their departure from the Island Comero, being the last island they see: and as they run to the northward, they will find fresh and steady gales at S. S. W. and S. W. and the more they run to the northward, the more westerly they will find the winds, and the fresher they blow. Sailing from Joanna for India.

It is customary for ships, when they take their departure from Comero, to make their course north-westerly; so as to make 1 deg. W. long. from Comero, when they are in lat. 8 deg. S. to avoid the shoals laid down in the draughts, &c. to the eastward. You have in this latitude variation 18 deg. 40 min. W. and in this run you will find a southerly current. To avoid the shoals in 8 deg. S.

From lat. 8 deg. S. and longitude, made 1 deg. W. from Comero, you may make your course north, something easterly, so as to run down your west longitude made; but not to make any east longitude from Comero, when in lat. 4 deg. 25 min. S. for in this latitude lies the Bassas de Palram, in the meridian of Joanna; or in long. 45 deg. 7 min. E. from London; and 1 deg. 15 min. E. from Comero. Being now in the meridian of Comero, and having crossed the latitude of Bassas de Palram, and got into lat. 4 deg. 10 min. S. and variation 15 deg. 45 min. W. you may now make your course N. E. or N. E. by E. so as to make 5 deg. E. long. from Comero, and variation 12 deg. 57 min. W. when you cross the line. I would not advise you to make more longitude from Comero to the line, than 5 deg. or 5 deg. 20 min. E. at most; for there lies upon the line a dangerous shoal, called the Bassas de Amber. I have conversed with several navigators, who assured me that they had seen this shoal, and that part of it is dry. All accounts agree that it lies upon the line; and I have endeavoured to ascertain its longitude, the accounts of which differ considerably; but I have taken great pains to take the medium, by which I make its longitude to be 51 deg. 38 min. E. from London, or 7 deg. 46 min. E. from Great Comero. If you cross the line, and have made 5 deg. or 5 deg. 20 min. E. long. from Comero, you will go 2 deg. 46 min. or 2 deg. 26 min. to the westward of it. With that longitude you will cross the line with 12 deg. 57 min. W. variation. Hereabouts you will find a southerly current, of from 10 to 15 miles, in the 24 hours. Bassas de Palram. What long. and variat. to cross the Line in. Bassas de Amber.

14 Sundry REMARKS and OBSERVATIONS made in

When clear of all danger. Continue your course N. E. or N. E. by E. till you are in lat. 3 deg. 30 min. N. and you have longitude, made from Comero, 9 deg. 30 min. E. and variation 11 deg. 28 min. W. You are then clear of all danger, and may steer as you please.

Directions for ships bound to Bombay. When ships have got thus far, in the above latitude, longitude, and variation, and are bound to Bombay, they will of course haul to the northward, in order to get into the latitude of their port, and then run down upon it with an east course. As they run to the north-eastward, they will decrease their variation very fast. If they come on the coast in July, or August, they will meet with strong gales and squalls, with abundance of rain, and thick hazey weather; and the wind constantly south-westerly, being the height of the S. W. monsoon.

Soundings off the Coast. Let a ship keep the parallel of 18 deg. 50 min. N. till she has soundings, which she will have 28 or 30 leagues off the coast, at 80 or 90 fathom, which shoalens very gradually, as you run in for the coast, in the above latitude; and in soundings you will have the variation 1 deg. 30 min. W. You will, at this time of the year, generally

A southerly current. find a current setting to the southward, along the coast, from 15 to 20 and 24 miles, in the 24 hours; which you must make an allowance for in your course steered, and may run in for the land by your soundings: if the weather is clear, you will see the land about Bombay, in 40 fathom water; and then you will be distant from the land 10 or 11 leagues: the land near Bombay, being very high, may be seen a great way in clear weather. From 55 fathom, brown sand, you will run 22 or 20 leagues before you shoalen the water to 36 fathom, muddy ground: in 36 fathom you will be 8 or 9 leagues off; and in 26 fathom you will be 6 or 7 leagues off; and in 17 or 18 fathom you will be 4 or 5 leagues off the land, in lat. 18 deg. 50 min. N. For more particular directions, see my Description of Bombay, with Direction for sailing into the Harbour; and my Draught of Bombay Harbour, and part of the Coast adjacent.

Caution, not to go to the northward of lat. 18 deg. 50 min. N. If you keep in lat. 18 deg. 50 min. N. you will run in exactly mid-way between Old Woman's Island and the Island Kanary; and you will shoalen your water gradually from 17 or 18 fathom, 4 leagues off shore, to 9 or 10 fathom, 5 or 6 miles off shore; but if you are to the northward, in lat. 18 deg. 57 min. or 19 deg. N. on the back of Old Woman's Island, at high-water time, you will have 10, 11, and 12 fathom within 2 or 3 miles of Old Woman's Island: and another disadvantage will attend your being to the northward, in the last-mentioned latitude, is, that as the winds are at S. W. and often S. S. W. you would not be able to fetch round the reef, in order to go into the harbour; but would be obliged to tack and stand off to sea again, by which you may lose time, and an opportunity of getting into the harbour.

A bank to the southward of lat. 18 deg. 45 min. N. If you are to the southward of lat. 18 deg. 45 min. N. you will cross a bank, with 24 and 26 fathom water on it, and 32 and 34 fathom between that bank and the shore; by which you may know you are not more than 7 or 8 leagues from the coast: see my Description of this Bank in my Description of the Coast of Malabar, &c.

Directions for Ships bound to the Coast of Coromandel, that have come through the Inner Passage, between Madagascar and the Continent; and have crossed the Line, and got as far as where I left them, when I began to give my Direction to the Ships bound to Bombay, &c. viz. in Lat. 3 Deg. 30 Min. N. and Longitude, made from Comero, 9 Deg. 30 Min. E. Variation 11 Deg. 28 Min. W.

Laccadive Islands. Being in the above latitude, longitude, and variation, and bound for the Coast of Coromandel, you direct your course for the Laccadive Islands, through which there are several passages or channels. As you run to the eastward, you will decrease your variation pretty fast; and amongst the Laccadive Islands you will have no more than 1 deg.

1 deg. 5 min. 1 deg. 8 min. or 1 deg. 10 min. W. variation; by which you may know when you have got the length of them.

In the S. W. monsoon, the winds between Cape Bassas and the Laccadive Islands blow constantly in the S. W. quarter, mostly from W. S. W. to S. S. W. and sometimes S. fresh and steady gales; and as you come near the Islands, you have fresher gales, and squally weather; unless it is in the latter end of the season, in the latter end of September, or the beginning of October; and then near the Laccadive Islands you will find little winds and variable, with squalls and rain.

Likewise, between Cape Bassas and the Laccadive Islands, there is a constant westerly current, which is very deceiving, and makes ships much out in their reckonings.

I have seen an account of the ship Pelham, and another Indiaman, on their voyage to Bombay, which were 1000 miles out in their reckoning: the one was carried in sight of the Island Soccatra, and the other in sight of the Coast of Arabia, by the westerly current, when, by their reckonings, they were looking out for the Coast of Malabar: so deceiving is the current; and I must say I think this a most extraordinary instance of it. However, I have reason to believe, from my own experience, and by the journals I have seen, that the current always sets to the westward, as before mentioned, but not in so extraordinary a manner as the Pelham found it. In the S. W. monsoon, between the Coast of Malabar and the Laccadive Islands, the current sets to the S. S. E. as the Coast lies, at the rate of 20, 24, or 26 miles in 24 hours; and amongst the Laccadive Islands the current sets to the S. S. W. and S. W. at the rate of from 18 to 22 miles in 24 hours; and you have this current about 2 or 3 deg. to the westward of the Laccadive Islands: then the currents set wholly W. or W. S. W. at the rate of 8, 10, or 11 miles in 24 hours; and you will frequently find the ship, by observation, 10, 12, or 14 miles to the northward or southward of the reckoning, but mostly to the southward; which makes it reasonable to believe the current sets mostly to the S. W. or W. S. W. between Cape Bassas and the Laccadive Islands, at the rate of 8, 10, 11, or 12 miles a day; which makes ships so much out in their reckoning: in sailing to the eastward, to the Laccadive Islands, their reckonings will always be much a-head of the ship; I therefore recommend the variation to them for their guide, which, if strictly observed, will always correct the reckoning, and particularly in sailing for the Laccadive Islands.

Winds and weather between Cape Bassas and the Laccadive Islands.

An extraordinary instance of it.

Variat. the best guide.

A Description of the Laccadive Islands, and the Channels between them; with their Latitude, Longitude, and Variation of the Compass; and their Bearings and Distance from each other.

The Laccadive Islands are all low, and sandy; covered with cocoa-nut trees; and are not to be seen above 5 or 6 leagues from the mast-head, in clear weather. Some of these Islands are inhabited, and others not, being so very low, that the sea sometimes overflows them; and they are surrounded with breakers, some distance from them. I shall only mention such of these Islands as ships go between, to the Coast of Malabar; which make the common channels, called the Nine-degree and the Ten-degree Channel, &c.

I have seen the Island Scuhelipar, from the mast-head, bearing N. by E. 6 leagues; but by its latitude, 10 deg. 2 min. N. as laid down in the charts of the New Directory, we could be no more than 13 or 14 miles from it. We saw it from 10 A. M. to 2 P. M. the weather clear, the sea smooth; and at noon had a very good observation, and were in lat. 9 deg. 49 min. N. variation, by several observations, both in the morning and evening, 1 deg. 8 min. and 1 deg. 5 min. W. I came from the Coast of Malabar, had a good passage and fair weather; and by our run from the Coast of Malabar, I made longitude, from Callicut to the Island Scuhelipar, 3 deg. 6 min. W. by which I compute the longitude of these Islands, and, I think, with great certainty. Accordingly I make the Island Scuhelipar

The Island Scuhelipar.

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Scuhelipar in lat. 10 deg. 2 min. N. and long. from London 72 deg. 24 min. E. from Cocheen 3 deg. 31 min. W. and from Anjanga 4 deg. 1 min. W. The variation in sight of this Island, 1 deg. 5 min. W.

The Island Malique. The Island Malique bears from the Island Scuhelipar S. S. E. $\frac{1}{2}$ E. distance from shore to shore, 16 or 17 leagues. Malique's lat. 9 deg. 12 min. N. long. from London 72 deg. 51 min. E. from Cocheen 3 deg. 4 min. W. and from Anjanga 3 deg. 34 min. W. Between the Islands Scuhelipar and Malique is reckoned the best passage to the Malabar Coast, and is called the Ten-degree Channel. The best latitude to keep in, to go through this Channel, is 9 deg. 36 min. or 9 deg. 40 min. N. By keeping in this latitude you will sail through this Channel with safety to the Malabar Coast; but, if you want to make either of the Islands, you must keep in a latitude accordingly: you will see Scuhelipar in lat. 9 deg. 49 min. and Malique in lat. 9 deg. 25 min. N. Be careful to

Ten-degree Channel. keep your parallel of latitude in sailing through these Islands; for, though the current in general sets to the southward, or south-westward, yet it sometimes sets to the northward. I have found it set 7, 8, or 10 miles to the northward, in 24 hours; but in general it sets to the southward and south-westward, as before mentioned.

Variation a sure guide. Suppose a ship in the Indian Sea, between Cape Bassas and the Laccadive Islands, steering to the eastward, in the S. W. monsoon, in order to go through the Ten-degree Channel, in the parallel of 9 deg. 36 min. or 9 deg. 40 min. N. and has reduced the variation to 2 deg. 30 min. W. she is then about 3 deg. of long. to the westward of the Island Scuhelipar; and when the variation is 1 deg. 30 min. or 1 deg. 27 min. W. about 1 deg. 40 min. or 2 deg. to the westward of Scuhelipar; and when the variation is reduced to 1 deg. or 1 deg. 5 min. W. she is as far to the eastward as the above-mentioned Island, and may depend upon it, is not far from it, if in the lat. 9 deg. 36 min. or 9 deg. 40 min. N. Steer to the eastward in this parallel of latitude, and you will go safely through this Channel. If you see either of the Islands, you may take a fresh departure, and direct your course for Cape Comaroon; but, if you pass through this Channel without seeing any of the Islands, which is often the case, as the weather, in the S. W. monsoon, is generally very cloudy and hazey, you must continue to steer to the eastward, in the above-mentioned parallel of latitude, till you strike soundings on the Coast of Malabar.

I. Calpeny. The Island Calpeny lies nearly due east of Scuhelipar about 27 leagues, and from Cocheen 2 deg. 11 min. W. its lat. 10 deg. 4 min. N.

I. Kelay. The Island Kelay bears from Malique S. by E. $\frac{1}{2}$ E. distance 17 or 18 leagues. Kelay's lat. 8 deg. 13 min. N. and long. from London 73 deg. 9 min. E. from Cocheen 2 deg. 46 min. W. and from Anjanga 3 deg. 16 min. W.

Nine-degree Channel. Between the Island Malique and the Island Kelay is also a very good passage to the Malabar Coast, and is called the Nine-degree Channel. The best latitude to keep in, to go through this Channel, is 8 deg. 45 min. or 8 deg. 50 min. N. Be sure to keep your parallel of latitude, and you will go through this Channel with safety; and run to the eastward till you get soundings on the Coast of Malabar, &c.

Soundings on the Coast of Malabar. In lat. 9 deg. 40 min. N. which is a little to the southward of Cocheen, you will strike soundings at 60, 50, or 40 fathom, 15, 13, or 11 leagues off the Coast; and the water will shoalen gradually as you run for the Coast. In the above latitude, and in clear weather, you can but just see the land from the deck, in 23 fathom water, distance off shore 6 or 7 leagues. Cocheen Flag-staff E. by N. 3 leagues, you will have 13 fathom water, oufey ground. You will find a southerly current, which will set you 24 miles to the southward in 24 hours. If you go into 28, 30, or 32 fathom water, that will be as near shore as you need go: you will, in the above depths, be 8, 9, or 10 leagues off shore. You may then steer a S. S. E. course, which will lead you along shore; or you may here take a fresh departure, and direct your course for Ceylon. As you run to the southward,

southward, you will deepen your water: in lat. 9 deg. 15 min. N. in 28 and 30 fathom water, you will not be more than 5 or 6 leagues off the land. If you go by your soundings, keep in 40 fathom. Off Anjango, in lat. 8 deg. 40 min. N. you have 24 fathom water within 5 or 6 miles of the shore. Off Ruttera Point you will have 25 or 26 fathom, within 3 miles of it. Keep out in 40 or 45 fathom, and you will go without the rock discovered by his Majesty's ship Elizabeth, in 1759; which lies in 35 fathom water. See my Description of Cape Comaroon, &c. If you have 40 or 45 fathom water off Cape Comaroon, you will be distant from it 8 or 9 leagues, and may then take your departure and steer for Ceylon, and make Point de Gall, according to the instruction given in its proper place.

Remarks and Directions for Ships that go the Outer Passage to India; or for those that are bound to China, through the Straits of Lomboc, Bally, or Sunda.

A Ship being in soundings off Cape Lagullas, in May, June, July, or August, and bound the Outer Passage, the latitude 37 deg. or 37 deg. 30 min. S. is high enough to run down the easting: in this latitude you will have strong gales from W. S. W. to S. S. W. and N. W. and in running to the eastward you will make but little alteration in the variation in sailing many degrees. In lat. 37 deg. 30 min. S. long. made from Cape Lagullas, 33 deg. E. there is 23 deg. 18 min. west variation; and in lat. 37 deg. 33 min. S. longitude, made from Cape Lagullas, 47 deg. 14. E. you will have variation 21 deg. 21 min. W. You have this variation about 7 deg. to the westward of the Islands St. Paul and Amsterdam.

Ships off C. Lagullas, & bound the Outer Passage.

A ship that intends to make the Island St. Paul must steer to the eastward, and keep in the parallel of lat. 37 deg. 30 min. or 37 deg. 35 min. S. Keeping in this latitude will carry you clear of St. Paul's, in the night or day, and yet will carry you fairly in sight of it.

Ships that intend to make I. St. Paul.

St. Paul's, the northernmost of these two Islands, is a small, but a high island, and may be seen at a great distance in clear weather; its latitude 37 deg. 52 min. S. and longitude, by computation from Cape Lagullas, 54 deg. 23 min. E. and from London, 74 deg. 38 min. E. There is 18 deg. 45 min. or 19 deg. west variation near these Islands. Ships that endeavour to make St. Paul's keep to the northward of it, in lat. 37 deg. 30 min. or 37 deg. 35 min. S. In this latitude you may very plainly see St. Paul's bearing S. by E. S. or S. by W. of you, distance 6 or 7 leagues. Ships may correct their reckonings by the variation off those Islands, without seeing them; that is to say, a ship being near the latitude of St. Paul, and having 18 deg. 45 min. or 19 deg. west variation, may be sure she is as far to the eastward as these Islands; that is, she is in and about the longitude of them; by which they may correct their reckoning as well as if they had seen the Islands, and may from thence take a fresh departure, and proceed on their voyage.

St. Paul's lat. long. & variation.

Ships may correct their reckonings by the variation.

I have been told, by an experienced and judicious commander in the India service, that he has several times corrected his reckoning by the variation off the Islands St. Paul and Amsterdam, without seeing them. Allowing the variation at or near these Islands to be 18 deg. 45 min. or 19 deg. W. when he has this variation he always reckons himself as far to the eastward as these Islands, or in the longitude of them. I shall here give you his own account of it.

An experienced commander's opinion.

"When by my variation (said he) I was convinced of being the length of the Islands St. Paul and Amsterdam, on examining my reckoning, I was, by account, full 12 deg. to the westward of the Islands."

Error in his reckoning, proved by the variation.

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- “ the eastward of the place where the ship was in; and accordingly, from 18 deg. 45 min
 “ or 19 deg. west variation, I stood full 17 deg. farther to the eastward, ere I lowered my
 “ latitude under 35 deg. S. and was careful not to get under the latitude of 26 deg. S.
 “ till I reduced the variation to 7 deg. W. In 22 deg. 30 min. S. I made the Coast of
 “ New Holland, variation then 5 deg. 20 min. W. and found the error of my reckoning
 “ agreeable to the variation.
- A 2d error in the reckoning, proved by the variation. “ A contrary instance happened this last voyage, when I was bound to Bencoolen,
 “ on the Coast of Sumatra: being the same length, with the variation 19 deg. W.
 “ I found myself 5 deg. to the eastward of account; but not being under the necessity of
 “ making New Holland, or of running so far to the eastward, I edged away to the north-
 “ ward, after running 10 deg. farther to the eastward, and in the same latitude, 37 or
 “ 38 deg. S. This height I think the best, as the winds hold mostly westerly, and fresh
 “ gales; whereas, under the latitude 30 deg. S. they are frequently easterly. I made the
 “ land 20 leagues to the eastward of Java Head, and had then 2 deg. 30 min. west
 “ variation; which again confirmed the error of my reckoning.
- Ships take their departure from St Paul to make N. Holland. “ A ship having made the Island St. Paul or Amsterdam, or supposing themselves as far
 “ to the eastward by their variation, 18 deg. 45 min. or 19 deg. W. and bound to China
 “ through the Straits of Lomboc or Bally, must steer for and make the Coast of New
 “ Holland, and for their guide observe the following directions.
- What lat. to make the Coast of N. Holland in. “ From the Island St. Paul, or from 18 deg. 45 min. or 19 deg. west variation, a ship
 “ may run 17 or 18 deg. to the eastward before they lower their latitude under 35 deg. S.
 “ and then be careful not to go under the latitude of 26 deg. S. till they reduce the variation
 “ to 7 deg. W. and make the Coast of New Holland in lat. 22 deg. 30 min. S. variation
 “ 5 deg. 20 min. W. and have the strictest regard to the variation.
- Approaching the Coast of N. Holland. “ But here I must observe, that till under the latitude of 26 deg. S. the Coast of New
 “ Holland must be approached with caution, as there is great danger; though there are
 “ many never-failing, and consequently unerring guides, to warn you of your approach;
 “ as great quantities of skuttle-bones, weeds, and drifts; and near the Bank, grampuses
 “ playing like seals, and innumerable quantities of tropick birds; but skuttle-fish and
 “ weeds are commonly the first marks. The land, in lat. 22 and 23 deg. S. is low;
 “ the soundings 130 fathom, mud, about 14 leagues off the Coast.
- Sound. and dist. off the Coast. “ Clouts Island is in general agreed, as to the latitude, 22 deg. 6 min. S. but not determined
 “ as to its longitude. I did not see it; but from making the Coast of New Holland, and
 “ comparing my observation of the variation with their's that have seen it, and their remarks,
 “ I am persuaded it does not lie above 1 deg. 30 min. or 2 deg. W. from New Holland:
 “ it is a very dangerous island; and ships bound through either the Straits of Lomboc,
 “ Bally, or Sunda, should be careful in passing the latitude. Its longitude is, by computation,
 “ 32 deg. 50 min. E. from St. Paul; and from Cape Lagullas, 84 deg. 26 min. E.
 “ Variation near this Island is 6 deg. W. and allowing Clouts Island to lie 2 deg. W. of the
 “ Coast of New Holland, the land in latitude of Clouts Island is, in longitude, 34 deg.
 “ 50 min. from St. Paul.

For the Straits of Lomboc.

- Ships bound to the Straits of Lomboc. “ A ship bound through these Straits must be sure to make the Coast of New
 “ Holland, as before mentioned, and take their departure from it in latitude 19 deg.
 “ 20 min. S. or thereabouts, to make the Coast of Cumbava, a little to the eastward
 “ of the Straits of Allas. The land hereabouts is easily known; for the Coast of
 “ Cumbava is very high and irregular land: yet on Lomboc there is a high and remarkable
 “ peak; which mountain is best seen through the Straits of Allas, being nearest that side.
 “ The

- " The shore is bold ; nor do I know, or have heard, of any danger, but what is perceptible. How to know the Straits of Lomboc.
- " Betwixt the Straits of Allas and the Straits of Lomboc, the shore, for the most part, is a sandy beach, with several large straggling rocks bordering the shore, and one seemingly large river. As we neared it, we perceived an immense number of fires. Our distance from the shore, I am persuaded, did not exceed 3 or 4 leagues for full 50 leagues that we coasted it, and, as we approached the Straits, little more than 3 or 4 miles.
- " In the entrance of the Straits of Lomboc, but nearest the Bally shore, is a large island, called Banditti, the ridge of which is extremely like a barn, appearing (at the distance it is first seen) sharp at top; the sides chalky, like the cliffs of our forelands. Off the ends of Banditti, as you near it, and as you open the passage betwixt that and Bally, in passing the N. E. end, there are many rocks, or little islands: at the same time you will see a deep bay at the bottom of a large mountain, called the Peak of Bally, which takes its spring from the west side of these Straits: and, were there no other guide, the Peaks of Lomboc and Bally distinguish these from any other, as neither those of Allas or Bally have such on both sides.
- " These Straits are extremely steep on either shore, and in the fairest and safest passage for any ship there are no soundings: the great rippings you will see in entering those Straits are uncommon, and have caused the generality of people to form dreadful ideas of there being rapid tides, which, joined to the want of soundings, and being liable to be becalmed by the high land, makes them dread apparent danger as real.
- " The Straits are short, as the east point of Bally may be seen from Banditti Island: A flux and there is a flux and reflux, but I could not learn the flowings, or time of high-water, at full and change; but a ship not hauling too soon round Lomboc, but keeping midway betwixt Banditti and Lomboc, let the stream be which way it will, there can be no danger; and if it blows, it will soon carry them clear. In light winds it would not be adviseable to haul too soon in for the Bally Shore, till well past Banditti Island, and then to round Bally Point pretty close, as the shore is bold and very clear.
- " Lest any may be tempted, from the inviting appearance of Bally Bay, without trial of the soundings, to enter it, I think it necessary to inform them, that I am of opinion there is no anchoring for a ship, as I sent my boats a sounding about 2 miles from the shore, and had no soundings; of which not being satisfied, as I saw several prows in the bottom of the Bay, near the shore, I went the day following myself, and not a mile from the shore, on the north side, had 150 fathom, rocky ground, and within a little more than a cable's length, 68 fathom, coral.

Banditti Islands.

The Peaks of Lomboc and Bally.

No soundings in the Straits of Lomboc.

A flux and reflux.

To keep in the midway between Lomboc & Banditti Island.

No anchoring in Bally Bay.

To go through the Straits of Bally.

- " By the draughts of these Straits, and views of the hills in the Waggoner, any body may know the entrance of these Straits: the principal care is securing the land-fall from New Holland; for it is esteemed, and I believe it to be, very impracticable to beat up, though they should fall but 10 leagues, to leeward, as the current and winds set hereabouts as the shore lies.
- " Ballamboung cannot be mistaken by the draught. You may anchor, with Goningham south, in 6 or 7 fathom water: after you get this length it will be very necessary to attend the shift of the stream, so as to take the beginning of it to weigh with, which, with the assistance of your boats, though it should be calm, will carry you through. Keep nearly mid-channel, and when you get up with Gilliboang you will meet with regular soundings.
- " The tides here set stronger than those I have met with in any other Straits, having found them to run 6 knots an hour: care, therefore, should be had not to come too close to any of

Anchorage.

Where you will meet with regular soundings.

Strong tides

" the

20 *Sundry* REMARKS and OBSERVATIONS made in

- Not to come close to any of the points. " the points, as the tide rounds the Bays very strong, and I have experienced the hazard of it in some ships for the want of this attention.
- Sea and land winds. " I have particularly remarked on these Coasts, betwixt the land and sea winds, and in these Straits, as well amongst the Islands betwixt them and Borneo, before a shift of the stream, a calm has succeeded, which, if properly noticed when there is anchoring ground, may secure what is got, besides preventing danger.
- A shoal between Gilion and Pondy. " I, passing these Straits for China, took particular notice, that the shoals are laid down very well in the Waggoner, betwixt the Straits and Madura, except that between Gilion and Pondy. This reef is very dangerous, being covered at high-water, and in the S. E. monsoon it is at no time very visible: ships that pass betwixt Pondy and Gilion must go very near it; and yet the passage is very good on either side the shoal, when it can be seen, or its situation well known. When the reef bears S. 31 deg. E. the S. E. part of Madura bears N. 17 deg. E. and the south part of Gilion, S. 35 deg. E.
- The bearings of the shoal. " In turning into the Channel, betwixt the Islands and Madura, for Zamonap, you may stand to the Islands to 13 or 14 fathom, and towards Madura side to 10 fathom; but you cannot enter the Bay of Zamonap; though you may anchor before the Bay, on the north shore, in 6 or 7 fathom water: here you may get fresh water, and other refreshments, of the Dutch, who have a fort here. Close round the point, in the Bay, there are several springs.
- Zamonap Bay. " The Osterly anchored in 5 fathom, blue mud; the south point of Zamonap, W. 13 deg. S. the point that forms the Bay of ditto, N. 23 deg. W. the Dutch Fort, N. 33 deg. W. the S. E. part of Madura, E. Gilion Island, E. $\frac{1}{2}$ S. distant from the nearest shore, 2 $\frac{1}{2}$ miles.
- Where the Osterly anchored. " To go between Pondy and Madura, you must keep the Pondy shore close on board; for it is very flat, for more than $\frac{3}{4}$ over, betwixt Madura and Pondy: you will not have less than 11 or 12 fathom within a mile of Pondy. In passing Gilion Island I would not haul up for Pondy till I was the length of the west end, and then steer for the point of the Island. If you should shoal to 4 or 5 fathom, as you haul to the Island you will deepen.
- To keep the Pondy shore close on board.

For the Back of Banca.

- The Island Lubec. " From Pondy, for the passage betwixt Borneo and Billiton, after leaving Pondy, I would steer N. W. by W. to get sight of the Island Lubec: this course will give it a good birth, for on the east side there are very dangerous and extensive reefs. From thence, steering N. W. will carry you clear of a large reef of rocks, that lie in lat. 3 deg. 35 min. S. this reef is likewise extremely dangerous, having 16 and 20 fathom, in many places, close to them, and the highest not 3 feet above the surface of the water; therefore, if it cannot be passed in the day, I would advise you to anchor.
- A large reef of rocks that lie in lat. 3 deg. 35 min. S. " From this latitude steer N. N. W. to the lat. 1 deg. 40 min. S. when you will make a very high island, with a great chain of small islands: betwixt 3 deg. 40 min. and 1 deg. 40 min. the soundings are from 22 to 18 fathom, sand, with some few casts, muddy soundings, extremely regular; but when you come to pass this latitude, i. e. 1 deg. 40 min. you will meet with soundings 18 fathom, fine red sand; and leaving the high land on your starboard side, steer N. W. rather westerly, which will carry you in sight of Pulo Auro; the soundings regular, from 18 increasing to 30 fathom: as you near the China Seas, sand mixed with mud: it may be you may see the Holy Spirits, but I know of no danger near them: I have seen them 7 or 8 leagues."
- Soundings in lat. 1 deg. 40 min. " of Pulo Auro; the soundings regular, from 18 increasing to 30 fathom: as you near the China Seas, sand mixed with mud: it may be you may see the Holy Spirits, but I know of no danger near them: I have seen them 7 or 8 leagues."
- Pulo Auro.

For the Straits of Sunda.

A ship being off the Islands St. Paul and Amsterdam, or near them, in 18 deg. 45 min. or 19 deg. W. variation, and bound to China, through the Straits of Sunda, is not under the necessity of making the Coast of New Holland, or running so far to the eastward; but may run 10 or 11 deg. farther to the eastward in the latitude 37 deg. 30 min. or 38 deg. S. Having made 10 or 11 deg. easting from St. Paul's, and in the above latitude, you may then edge away to the northward, and will then decrease your variation pretty fast. In lat. 34 deg. 46 min. S. and longitude, made from St. Paul's, 13 deg. 26 min. E. you will have 13 deg. 30 min. W. variation.

In lat. 25 or 26 deg. S. and longitude, made from St. Paul's, 27 deg. 30 min. E. or hereabouts, you will meet the S. E. trade-winds, strong gales; and in lat. 10 deg. S. longitude, made from St. Paul's, 33 deg. E. you will have variation 2 deg. 30 min. W. With this variation you will make the land in lat. 8 deg. 16 min. S. 20 or 25 leagues to the eastward of Java Head; and all ships, bound through the Straits of Sunda, should take care to fall in with the land to the eastward of Java Head. I have known ships that have, through their want of proper attention to the variation, fallen in to the westward of the Straits of Sunda, and have been obliged to go through the Straits of Malacca, with great loss of time.

As you approach this part of the Coast of Java, you will see a great number of birds like boobys, and drifts of bamboos, which is a certain token that you are near the Coast; but let the variation be your guide: take care not to decrease it below 2 deg. 30 min. W. before you make the land of Java, and you cannot err; and endeavour to make the land in lat. 8 deg. or 8 deg. 15 min. S.

In sight of Java, in lat. 7 deg. 15 min. S. the extremes of the land bearing from N. E. by N. to N. $\frac{1}{2}$ W. distance 10 or 12 leagues, variation 2 deg. 5 min. or 2 deg. 8 min. W. Between the west end or west point of Java and Prince's Island, is the best passage into the Straits of Sunda, having soundings on both sides; especially along the Java side there is all along good anchoring from 20, 25, and 30 fathom water. The course through, between Prince's Island and Java, is E. N. E. northerly, being a fair channel, no danger but what is visible to the eye.

In these Straits, between Prince's Island and the Sumatra Shore, there is very deep water, especially toward the Sumatra Shore; in some places no soundings, whereas all along the Java side there is good anchoring, as before mentioned; so that it is best to keep along the Java side. Java Head, lat. 6 deg. 40 min. S.

For Ships bound to India or China early in the Season.

SHIPS bound to India or China early in the season, and going round the Cape of Good Hope in the months of March or April, must not come near the Cape of Good Hope; for at the Cape, and all along the Coast to the eastward of the Cape, at this time of the year, the S. E. winds prevail, and frequently blow pretty strong. Such ships bound to India or China, at that time of the year, must keep to the southward, in lat. 39 or 40 deg. S. where they will have fresh and steady gales at W. S. W. S. W. and N. W. with which they will quickly run down their easting. They may see Gough's Island, which is high land, and lies in lat. 40 deg. 15 min. S. and long. 3 deg. 23 min. E. from the Lizard. They should keep in that high latitude till they draw near the longitude of the Islands St. Paul

M

and

and Amsterdam; and they may either make those Islands, or go so near them as to correct their longitude or reckoning by the variation, as before mentioned; and they will probably have a quick passage to India; or to either of the Straits, which ever they are bound to; and after taking their departure from St. Paul or Amsterdam, they may proceed according to my former directions.

Capt. Vincent, in the *Osterly*, in the year 1758, being early in the season, kept to the southward in lat. 40 deg. S. and run a great many degrees to the eastward in this parallel of latitude, and had the highest variation he ever found in the Indian Seas, viz. 27 deg. W. made the island called Gough's Island, which is high land, taking its name from Capt. Gough, who, it is supposed, was the first that ever saw it. Capt. Gough saw it in 1715; Capt. Vincent in the year 1758, and made it in the same latitude and longitude that Capt. Gough did; that is, in lat. 40 deg. 15 min. S. long. 3 deg. 23 min. E. from the Lizard, though Capt. Vincent is persuaded it lies to the westward of the Lizard, by his finding his reckoning several degrees a-head of the ship. I believe this Island is little known to the generality of people that go this track; and it is a pity but its exact situation was ascertained.

For Ships bound to India, passing the Cape of Good Hope late in the Season.

SHIPS off the Cape of Good Hope, or in soundings off Cape Lagullas, in the latter part of the season, as in September, or any time between September and April, and bound to India, must go the track I have before mentioned; and run down their easting in lat. 37 or 38 deg. S. making the Island St. Paul or Amsterdam; and from thence take a fresh departure, but need not make so much easting as ships bound to the Straits of Sunda; but from St. Paul and Amsterdam they may run down their northing and easting together, and will decrease the variation very fast as they run to the northward. In lat. 25 deg. S. they will meet with the S. E. trade-winds; and in lat. 10 deg. 30 min. S. they will have reduced the variation to 30 min. W. and on the Line there is 38 or 45 min. E. variation, and from 40 to 50 min. E. or thereabouts all over the Indian Seas. From this latitude 10 deg. 30 min. S. to the Line, in the months of November, December, January, February, and frequently in March, you will meet with fresh gales of wind from S. W. to N. W. with squally weather and much rain: here ships may run down their easting very fast from 10 deg. S. to the Line; and ships, who want to run down their easting, should take care to do so before they cross the Line; for as soon as they cross the Line, and get into north latitude, they lose the fresh westerly winds which they had from lat. 10 deg. S. to the Line; and in lat. 1 deg. N. they will meet the N. E. monsoon, which blows constantly in the Indian Seas, from October to April, between N. E. by N. and E. N. E.

And let a ship be bound to what part of India she will, in this season, they should endeavour to keep as far to the eastward as Acheen Head; and, if bound to Bengal, must keep to the eastward of the Nicobar and Andaman Islands, and along the Arracan Shore till they can stretch over for Ballasore Road; and if bound to Madras, they may stretch over from Acheen Head, and fetch their port very well, taking care to fall well to the northward of it, on account of the winds being mostly northerly, and the current running strong to the southward; for, should a ship fall into the southward of her port, they will lose much time, and have much trouble, before they can gain their port.

For

For Ships bound to the Coast of Malabar.

And if a ship is bound to the Coast of Malabar, Bombay, &c. and being off Of the cur-
Acheen Head, she must steer for Ceylon, and take care to fall in with Ceylon, about rents.
the Fryar's Hood or the Great Basses; and then to keep the Coast of Ceylon close
aboard, and then coast it by Point de Gall, &c. and take care to keep in soundings,
so that in calms or contrary winds you can anchor; by which means you will prevent
your being drove off the Coast by the strong S. W. currents, as some ships have
been drove from Ceylon to the Maldivé Islands, by their not keeping in anchoring-
ground.. See my Directions for coasting it round Ceylon, &c.



A Description of the Road and Harbour of Bombay.

THE Town of Bombay is situated on the S. E. part of the Island of the same Bombay
name, and lies in latitude about 19 deg. N. It is fortified all round on the land Harbour.
side, has a strong fort or castle which commands the Harbour, which is large and
safe, where ships lie sheltered from all winds; but is both difficult and dangerous of access,
on account of sundry rocks and shoals that lie hid under water: therefore it would
be imprudent for any person, not well acquainted with these, to attempt carrying a ship
in without a pilot, who generally come off to ships when they appear in the offing; though
I have often seen ships above the Sunken Rock, before the pilot has been on board, when
the greatest danger is past: and as there are no good draughts of this Harbour, nor have
I ever seen a good description of it, or tolerable directions for sailing into or out of this
place, I shall therefore give a description of the appearance of the land about Bombay,
and the dangers going into and out of this Harbour; with the exact marks for them,
and the best marks to go clear of them; as also of the best anchoring-places, both in the
fair and foul-weather monsoon, &c.

Instructions for knowing the Land about Bombay Harbour.

The high land of Choul, which is to the southward of Bombay, is a high bluff to the Land of
northward, and the southernmost part low land, stretching out to the westward; at a Choul.
distance making very much like islands: from thence to the northward you will see the Tull.
high land of Tull; and then the Island Caranjar, which is very remarkable, having a I. Caranjar.
high hill at each end, and extremely low in the middle: at a distance they appear to be
separate islands. The southernmost of these hills is the largest and highest, and is called
Great Caranjar: on the northern part of this hill, quite on the top of it, are the remains
of an ancient monastery, built by the Portuguese when they were in possession of this part
of India. The other hill on this island is also high, and is called Little Caranjar. These
hills bear S. by E. and N. by W. of each other, and are about a mile asunder. This
Island makes the eastern part of the Harbour of Bombay.

A little to the northward, and eastward withall, of Little Caranjar, lies a small island, I. Elephanta
called Elephanta, which appears at the distance of 3 or 4 leagues, with the 2 hills of
Great and Little Caranjar, like 3 separate islands; the Elephanta the lowest and smallest
of the three.

To

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The Neat's Tongue. To the northward of the Elephanta, there is a very remarkable high land, which makes like a neat's tongue, the bluff end to the northward: it may be seen, in clear weather, 14 or 15 leagues. When the highest part of the Neat's Tongue and Bombay Church are in one, they bear N. E. by N.

Malabar Point. As you run in for the land from the westward, you will raise Malabar Point: this is the first part you will see of Bombay Island, which appears flat, and full of trees; and, as you approach it nearer, it makes in a steep point to seaward, with a small white pagoda a little to the northward.

Islands Hunary and Kanary. Hunary and Kanary are two small islands, in lat. 18 deg. 45 min. N. and are not to be seen farther than the Tombs on Old Woman's Island. Kanary, when first seen, appears like 2 small rocks or islands, a small distance asunder, (it being higher at the extremities than in the middle) by which it may be known: this is the outermost of the 2 islands, and is fortified all round. From the Island Kanary to the southernmost part of Old Woman's Island the course is N. $\frac{1}{2}$ E. 10 or 11 miles: the depth of water between them is 8, 9, and 10 fathom.

Old Woman's Island. Old Woman's Island is separated from that of Bombay by only a very narrow channel of the sea, which is fordable at half-tide: it is about $1\frac{1}{2}$ mile in length, but very narrow; lying N. by W. and S. by E. There are two remarkable white tombs on it, which may be seen a great way at sea; the one round, which is also the whitest; the other square: they bear S. 52 deg. 30 min. W. and N. 52 deg. 30 min. E. of each other. It has also a high grove of cocoa-nut trees on that part of it next Bombay. The outer or southernmost part of this Island is the highest; on which is a look-out-house, with attendants, where signals are made to the Fort when they see any ships or vessels in the offing: the other parts of this Island are low.

Funnel Hill. There is a remarkable hill, a considerable distance in land, which bears the resemblance of a funnel turned upside-down, and is therefore called Funnel Hill. Whether it be a tower built on the top of this hill, or the effect of nature, I cannot tell.

The Dangers going into and out of Bombay Harbour; with the Marks for them.

Reef off Old Woman's I. The first danger, that lies in the way, going into Bombay Harbour, is the reef off the southernmost part of the Old Woman's Island, which runs out in two prongs, one towards the S. E. and the other to the S. W. full 2 miles. Great part of this reef dries at low water. These prongs are the more dangerous, since the water does not shoalen as you approach them, especially the S. W. prong, there being as much water within a ship's length thereof, as there is a mile without it, viz. $7\frac{1}{2}$ fathom at low, and $9\frac{1}{2}$ fathom at high water; and the same water between the prongs. The S. E. prong is not quite so steep to: it shoals from 8 or $7\frac{1}{2}$ fathom, to $5\frac{1}{2}$, 5, and $4\frac{1}{2}$ fathom, with over-falls of 1 or $1\frac{1}{2}$ fathom, more or less, at a cast; so that great ships should be very cautious in standing towards this reef, and take special care that they do not get between the prongs; for there sounding will be no guide to them in that respect.

The marks for the outer part of the S. W. prong are, the Flag-staff of Old Woman's Island, on the highest part of the Neat's Tongue, N. 40 deg. E. and the Funnel Hill on with, or touching, the first rising low land, at the foot of the north part of Great Caranjar Hill. The Funnel then bore east; had $1\frac{1}{4}$ and $\frac{1}{2}$ fathom at low water; a ship's length without that, had $7\frac{1}{4}$ and $7\frac{1}{2}$ fathom, and the same water between the prongs.

The marks for the outer part of the S. E. prong are, the Oyster Rock, a ship's length open with the N. E. bastion of Bombay Fort, when the north part of Great Caranjar Hill bore E. 3 deg. S. and the inner part of Malabar Hill on with the outer part of Old Woman's Island; then had $3\frac{1}{4}$ and $3\frac{1}{2}$ fathom at low water, with great over-falls of about 2 fathom

2 fathom at a cast; and, when the Oyster Rock was on the N. E. bastion, had $6\frac{1}{2}$ and 7 fathom; at high water, $8\frac{1}{2}$ and 9 fathom.

The Sunken Rock is also very dangerous, as it lies right in the fair way going into and out of the Harbour, and is steep to, there being as much water within half a ship's length of it, as any where without it. There is 7 and $6\frac{1}{2}$ fathom close to it. Part of this Rock dries at low water on spring-tides. Sunken Rock.

The marks upon it are, Mazagon House (a square white house under Mazagon Hill) just shut in with the N. E. bastion of Bombay Fort, which bore N. 9 deg. E. the Flag-staff on Old Woman's Island, N. 73 deg. W. Malabar Point, N. 36 deg. W. and the round white tomb on Old Woman's Island, which is the northernmost, N. 27 deg. 30 min. W.

The Dolphin Rock is also very dangerous, being dry at low water, spring-tides, and as there is 4 and $3\frac{1}{2}$ fathom, within a ship's length of it, at low water. Dolphin Rock.

The marks upon this rock are, Malabar Point half a ship's length open to the northward of the north part of the grove of cocoa-nut trees, on the north part of Old Woman's Island, which is called Broughton's Grove; and the brab-tree in Bombay Castle in one with Dungaree Fort; also the round white tomb on Old Woman's Island and a low brab-tree in one.

Right opposite Bombay there is a shoal, called the Middle Ground, which is very dangerous. It is formed by sharp ragged rocks, like pyramids, and of course has very irregular soundings upon it, shoaling or deepening 2 fathom at a cast. This shoal is steep to on all sides, having $4\frac{1}{2}$ or 5 fathom close to it at low water, which is as much as there is in any other part of the Harbour; and has about 3 feet water on it, at low water, on spring-tides; though sometimes, in the S. W. monsoon, I have seen about the length of a boat of it dry. Middle Ground.

The marks for the shoalest water on the Middle Ground are, Mendam's Point N. 73 deg. W. Bombay Church and Hough's House in one, N. 43 deg. W. and Suree Fort just shut in with, or touching, the east part of Cross Island, N. 8 deg. 30 min. E.

The Shoal of Caranjar is very dangerous: it is mostly sand, but in some places there are rocks: it lies N. and S. from the south point of Great Caranjar to the north point of Little Caranjar, and stretches $\frac{1}{2}$ of the Harbour over from Caranjar; having only 6 feet water on it at low water, and in very low tides part of it is dry: on most parts of it the soundings are very irregular, from 3 to 1 fathom: when you come near it, you shoalen your water from $6\frac{1}{2}$ to 4 fathom, and soon to 3 and $2\frac{1}{2}$ fathom. Caranjar Shoal.

The marks for Caranjar Shoal are, the south point of the Neat's Tongue just coming on with the west part of Butcher's Island. You are then on the outer edge of it. When the Funnel Hill is on with the north part of the island that lies to the eastward of Little Caranjar, you are then on the north part of it; and, when the south part of Great Caranjar bears E. $\frac{1}{2}$ N. you are then on the south part of it.

There is likewise another shoal off the west point of Pen River, called Tull Point; which is very dangerous, being sharp rocks with irregular soundings on them: on this shoal the Medway struck, and narrowly escaped being lost: it has $3\frac{1}{2}$, $3\frac{1}{4}$, and 3 fathom water upon it. As you approach it, the water shoalens suddenly from 7 to 4 and $3\frac{1}{2}$ fathom. Tull-Point Shoal.

When the outer low point of Pen River, and the high bluff inner point of the same River are in one, (E. $\frac{1}{4}$ S.) you are right off it: it lies right out about a large mile W. $\frac{1}{4}$ N. and is pretty broad.

Instructions for a large Ship to round the Reef off Old Woman's Island into Bombay Road and Harbour.

Being in the offing, in between 10 and 12 fathom, steer in for the outer or southern part of Old Woman's Island, till you open the Funnel with the north part of Caranjar To clear the S.W. Prong Hill:
N

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Hill : keep them just touching ; they will then bear E. $\frac{3}{4}$ N. Steer to the eastward with these marks on ; and when the Flag-staff at Old Woman's Island is on with the highest part of the Neat's Tongue, or N. 40 deg. E. you are then a-breast of the S. W. Prong. By still steering on to the eastward with the same marks, you will have 9, 9 $\frac{1}{2}$, and 10 fathom, according to the time of tide : and when you bring the Oyfer Rock to the westward of Bombay Flag-staff, you will be clear of the S. E. Prong, and will have depth of water from 8 $\frac{1}{2}$, 9, 9 $\frac{1}{2}$, or 10 fathom, according to the time of tide. You may then haul to the northward, and steer up towards the Harbour, with the latter marks on ; and when you have shut in Malabar Point, with the outer part of Old Woman's Island, in 8 fathom, then keep to the eastward, and open Mazagon House a sail's breadth to the eastward of the N. E. bastion, in 7 $\frac{1}{2}$, 8, or 8 $\frac{1}{2}$ fathom. Steer up the Harbour with these marks on (N. 10 deg. E.) ; and when Malabar Point is on the north part of the Brab-Grove, (on the outer part of Old Woman's Island) you are then a-breast of the outer or southern part of the Sunken Rock ; and when the round white tomb is on with the southern part of the Oyfer Rock, you are clear to the northward of the Sunken Rock, in 7 $\frac{1}{2}$, 7 $\frac{3}{4}$, and 8 fathom ; and may then haul in towards Old Woman's Island, in 7 $\frac{1}{4}$ and 7 $\frac{1}{2}$ fathom.

To clear the
Sunken R.

To clear the
Dolphin R.

Now, to keep clear of the Dolphin Rock, you must open the Bunder Gate to the eastward of the Battery Pier-head ; and when Malabar Point is opened a large ship's length to the northward of the north part of Broughton's Grove, you are then clear to the northward of the Dolphin Rock, in 6, 6 $\frac{1}{4}$, and 6 $\frac{1}{2}$ fathom.

Another good leading mark to go clear of the Dolphin is, go no nearer Old Woman's Island than to bring Dungaree Fort and Bombay Flag-staff in one ; but rather keep Dungaree Fort a ship's length open to the eastward of the Flag-staff ; which carries you clear of all danger from Old Woman's Island, after you are past the Sunken Rock, in 5 $\frac{3}{4}$, 6, and 6 $\frac{1}{2}$ fathom, according to the time of tide.

To clear the
Middle Gr.

To avoid the Middle Ground, (going to the eastward of it) keep Suree Fort a large ship's length to the westward of Cross Island. This will carry you directly to the Harbour of Bombay, which is between the Middle Ground and the Fort ; where you may anchor in 4, 4 $\frac{1}{4}$, or 4 $\frac{1}{2}$ fathom at low water, and 6 $\frac{1}{2}$ or 7 fathom at high water. To go to the eastward of the Middle Ground, you must open Suree Fort 2 large ships lengths to the eastward of Cross Island ; which will carry you clear in 5 $\frac{3}{4}$, 6 $\frac{1}{2}$, and 6 $\frac{3}{4}$ fathom. The best mark for the southern part of the Middle Ground is, Malabar Point and Mendam's Point in one ; and this mark will carry you clear, to the southward, in 5 $\frac{1}{2}$, 6, and 6 $\frac{1}{2}$ fathom. Also, the best mark for the north part of the Middle Ground is, the Church-Steeple in one with the Bunder Gate ; and this will carry you clear, to the northward, in 4 $\frac{1}{2}$, 5 $\frac{1}{2}$, and 6 fathom.

Instructions for turning into Bombay.

Being in the offing, with the winds contrary, so that you are obliged to turn it into Bombay ; when you have got so far in as to have opened the Funnel Hill to the northward of the north part of Great Caranjar Hill, and you are standing to the westward, towards the reef off Old Woman's Island, you ought to tack just before you bring the Oyfer Rock on with Bombay Flag-staff : this is a good mark for you until you shut in Malabar Point with the outer part of Old Woman's Island. The next turning-mark on this side the Harbour is, having shut in Malabar Point with the outer part of Old Woman's Island, you must not stand further towards Old Woman's Island than to bring Mazagon House a ship's length open to the eastward of the N. E. bastion of Bombay Fort : and when you have passed the Sunken Rock, which is when the round white tomb on Old Woman's Island is on the south part of the Oyfer Rock, you may then stand towards Old Woman's Island,

Reef off Old
Woman's I.

The Sunken
Rock.

Island, and tack just before Dungaree Fort is on with Bombay Flag-staff. This is a good mark for you all the way up to the Harbour.

Instructions for standing in towards the Eastern Shore.

Being in the offing as before, and you are turning into Bombay, you may stand towards Tull-Point the eastern shore into 7 fathom water, but come no nearer; and when you come a-breast Shoal. the southernmost point of Penn River, called Tull Point, off which there is a dangerous shoal, (a description whereof has been given in p. 25.) stand no nearer the point than 7 fathom, and guard against the indraught of Penn River; the flood setting strong round this point into Penn River, which if you are drawn into, you will be obliged to anchor, though the bottom is very foul and rocky, which makes it dangerous anchoring: but as the flood sets strong in, so does the ebb set as strong out, which may be as much to your advantage as the flood was to your disadvantage; for, if you should happen to be over on that shore, when the ebb begins to make, it will set you up to windward, and enable you to fetch into Bombay. And for a long mark stand no further to the eastward than to keep the south point of the Neat's Tongue a large ship's length open to the westward of the west part of Butcher's Island, which will carry you clear both of this shoal, and that of Caranjar: so that in turning up to Bombay, as you may have occasion to make Caranjar several trips over towards Caranjar, observe always to tack when the south part of the Shoal. Neat's Tongue comes within a ship's length of the west part of Butcher's Island.

It is very common for ships, with the wind northerly, to turn up between Caranjar Between Caranjar & the Middle Ground, and come round to the northward thereof, into the Harbour, which is the best way to come in on that occasion. As I have already mentioned the marks to keep clear of the Middle Ground on all sides, I shall refer you thereto in p. 26. You will have 7, 8, or 9 fathom between the Middle Ground and Caranjar Shoal, according to the time of tide.

In the S. W. monsoon (which is the bad-weather time here, when no ships can be S.W. mon- hove down at Bombay, on account of the swell that is there at that season) ships go behind soon. Butcher's Island, and heave down there, where the sea is much smoother, as several of our Squadron did in the year 1761. But as the navigation from Bombay to Butcher's Island is somewhat difficult (on account of a large reef of rocks, that lie to the south-westward of Butcher's Island, both above and under water; and another reef of rocks, that lie over towards the Shoal of Little Caranjar, which is never seen but on extraordinary spring-tides, at low water) I shall here give the leading marks for carrying a ship to Butcher's Island from Bombay.

Keep Blatchford's House (a high house in Bombay) about its breadth open with the From Bom- Battery Pier-Head, which will lead you clear of all danger to Butcher's Island. You will bay to Butcher's I. have depth of water, in going, 5, $5\frac{1}{2}$, and 6 fathom for about half way over; and as you come nearer Butcher's Island, you will have 7, 8, and 9 fathom, according to the time of tide. There is another leading mark, which you will see as you run over, equally as good as Blatchford's House; and when you are $\frac{2}{3}$ of the distance over, it is better, by being nearer to you and better seen, viz. on the south part of a low island (called Hog Island) which is extremely low, are some tall straggling trees: about a ship's length from the low extremity of this point, you will see a tuft of large high green trees: keeping this tuft of trees open, or shut, or just touching with the south point of the Elephanta, will carry you clear of all danger. Run with this mark till you open all the high land of the Neat's Tongue to the eastward of Butcher's Island: then haul up to the northward for Butcher's Island, and anchor to the eastward of it, right off the Tower, in $4\frac{1}{4}$ fathom at low water, and $6\frac{1}{2}$ or 7 fathom at high water, $1\frac{1}{2}$ cable's length from the

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the Island. Here the tides run very strong. Between Butcher's Island and the Elephanta you have 6, 7, 8, and 9 fathom water. Off the N.E. part of Butcher's Island there is a shoal runs out for a considerable way. The S.E. point is bold to; but off the south point begins the rocky reef, which is very dangerous.

Marks for anchoring in Bombay Harbour.

The Har-
bour.

The proper place for anchoring is between the Middle Ground and the Fort. Large ships should not go higher up than to bring the brab-tree in the Fort in one with the flag-staff; or rather the tree open to the southward of the flag-staff. Higher up is shoal water, and not fit for great ships. The lower part of the Harbour is when Mendam's and Malabar Points are in one. Between these is, what is properly called, the Harbour; being very large and safe, and fit to contain a great number of ships.

Best birth.

As good a birth, and as convenient as any in the Harbour, is the Church Steeple on the north part of Hough's House N. 47 deg. W. Bombay Flag-staff N. 29 deg. W. and Cross Island N. 21 deg. E. With these bearings you are about a large quarter of a mile distant from the Fort, and have 4 fathom at low water, and $6\frac{1}{2}$, and $6\frac{3}{4}$ fathom at high water; and no where in the Harbour is there above $4\frac{1}{2}$ fathom at low water, spring-tides. Indeed, just within the south or lower part of the Middle Ground, you may lie in $4\frac{1}{4}$ and $4\frac{1}{2}$ fathom at low water.

The Road.

When ships are ready for sailing, they go out into, what is called, the Road, which is to the south-eastward of the Middle Ground, where they anchor in $5\frac{1}{2}$ fathom at low water, and $7\frac{1}{2}$ or 8 fathom at high water, Bombay Flag-staff N. by W. $\frac{1}{2}$ W. or N.N.W. the Flag-staff on Old Woman's Island W. by S. $\frac{1}{2}$ S. and Broughton's Grove W.N.W. $\frac{3}{4}$ N. distance from the Fort about a mile, or $1\frac{1}{4}$ mile.

Another
Road.

There is a good anchoring-place for great ships without the Middle Ground. In May, 1761, the whole of his Majesty's squadron being at Bombay, part whereof being ready for the sea; and as it was then the bad-weather monsoon, it was thought unsafe for those ships that were fit for sea, and drew too much water, to lie in the Harbour, there not being at low water, spring-tides, above 2 feet more than they drew: they accordingly went without the Middle, where they moored, and lay in safety, in $6\frac{1}{4}$ fathom at low water, and $8\frac{1}{2}$ fathom at high water. The bearings we had in the Elizabeth, which was one of them: the Flag-staff on Old Woman's Island and the Oyster Rock in one, W.S.W. Bombay Flag-staff N.W. $\frac{1}{2}$ W. Cross Island N. $\frac{1}{4}$ W. the Bunder Gate on with the Church Steeple N. 55 deg. W. and Mazagon Fort a sail's breadth open to the eastward of Cross Island N. 10 deg. W. Here ships have room enough to drive, and let go another anchor, if they happen to part their cables, in the stormy months.

Another
Road.

There is another good anchoring-place, where ships may anchor when they cannot get out in one tide, which often happens in the S.W. monsoon: therefore, in order to keep what you have got, and to be ready to take the advantage of the next tide, the best place to anchor in is, to bring Malabar Point on with, or touching, the outer part of Old Woman's Island N. 19 deg. W. and the breakers on the Sunken Rock on with Bombay Flag-staff N. 9 deg. E. in 7 fathom at low, and 9 fathom at high water. Here you are well sheltered from the great S.W. swell by the reef off Old Woman's Island, and the bottom clear, and good holding ground.

Directions for sailing out of Bombay Harbour.

Being bound outward from Bombay, keep Suree Fort a ship's length open to the westward of Cross Island, which will carry you clear of the Middle Ground; and when you

you open Malabar Point to the southward of Mendam's, you are then to the southward of it, and may haul out to the eastward: steer down the Harbour, with Mazagon House a ship's length, or only a sail's breadth open, with the N.E. Bastion (which will carry you clear of the Sunken Rock) till Malabar Point is open to the southward of the Brab To clear the Grove, on the outer part of Old Woman's Island. You are then past the Sunken Rock, ^{Sunken R.} and may shut Mazagon House in with the N.E. Bastion; and when you open Malabar Point with the outer part of Old Woman's Island, you may keep close up under the Reef, To clear the if the wind is westerly (as it generally is in the afternoon); and for a leading mark, keep ^{Prongs.} Bombay Flag-staff a sail's breadth, or a ship's length open to the eastward of Oyster Rock, till you have shut the Funnel Hill in with the north part of Great Caranjar Hill, when you are clear of all the Reef off Old Woman's Island, and may haul to the westward as you please.

If you are bound out, and have the wind fair, keep Suree Fort a ship's length open ^{With the} to the westward of Cross Island; and when Malabar Point is open with Mendam's ^{wind fair,} Point, you are to the southward of the Middle Ground. After you are below the ^{going out.} Middle Ground, you may keep more to the eastward, and need no other mark but to keep Mazagon House a sail's breadth open to the eastward of the N.E. Bastion, till you shut the Funnel Hill in with the north part of Great Caranjar Hill; when, being clear of the S.E. Prong, you may haul to the westward, or do as you please; and when Bombay Church is on with the highest part of the Neat's Tongue, N.E. by N. you are clear of the S.W. Prong.

And if you are coming in with the wind large, you need no other marks than, when ^{Coming in,} you have opened the Funnel Hill to the northward of the north part of Caranjar ^{with the} Hill, ^{wind fair.} to keep Mazagon House a sail's breadth open with the N.E. Bastion, which will run you up the Harbour, clear of all danger, till you come to the foot of the Middle Ground; and then be sure to open Suree Fort a ship's length to the westward of Cross Island before you bring Malabar Point and Mendam's Point in one, and so run up to the westward of the Middle Ground, and anchor between it and the Fort, as you please.

The reason why I have given so many marks in the above directions is, to shew how near a ship may borrow upon the Reef, with a scant wind, in order to make the most of the wind, time, and tide, in going in or out of the Harbour: for, by a ship's keeping close up under the Reef with a westerly wind, and rounding the Sunken Rock as close as possible, a ship may fetch into the Harbour; whereas by giving them too large a birth, she will not.

Marks for coming into Bombay, in hazy Weather:

Being in the offing in hazy weather, so that you cannot see the proper marks for ^{In hazy} coming into the Harbour, observe what follows: If you cannot see the Funnel Hill, which ^{weather.} is sometimes the case, keep the north part of Great Caranjar E. by N. till you open the Harbour of Bombay; and if you cannot see Mazagon House nor Hill, which is often the case in hazy weather, then keep the N.E. Bastion of Bombay Fort N. or N. $\frac{1}{4}$ E. which will carry you clear of the Sunken Rock; and when you are within that, you will see the other marks to carry you clear of the Middle Ground, &c.

Being in the opening of the Harbour, and you can see nothing else but the N.E. Bastion, and Dungaree Fort, keep the said Fort just open, or touching the N.E. Bastion, and you may be sure that mark will carry you clear of the Middle Ground, and also of the Dolphin Rock, into the Harbour; where you may anchor with safety.

The setting of the Tides in and out of Bombay.

The first of the flood sets S.E. by E. across the points of the reef off Old Woman's Island. The middle and latter part of the flood sets E. and E. by N. right across the Harbour into Penn River, very strong; and the ebb the reverse. When Malabar Point and the outer part of Old Woman's Island are in one, you then have the tide set up the Harbour N. by E. and it continues to set so as far as the upper part of the Middle Ground, without which it divides, and one part sets strong over towards Butcher's Island, and then runs to the eastward, between Butcher's Island and Little Caranjar, where it soon divides again, one part setting to the S.E. between the Elephanta and Little Caranjar; and the other between Butcher's Island and the Elephanta: and from the upper part of the Middle Ground, another part sets to the northward up to Cross Island; from thence to Suree, and so round the Island of Bombay, &c. and the ebb the reverse. Note, the tide runs longer without the Middle Ground, than any where within it. In the Harbour it flows full and change, nearest S. by E. and N. by W. 11 hours 15 min. or $\frac{1}{4}$ after 11 o'clock; and in the offing N. and S. or 12 hours. It flows perpendicular 16 or 17 feet in spring-tides.

The latitude of the southernmost part of Old Woman's Island, by several observations, is 18 deg. 56 min. N. The longitude of ditto, computed from the astronomical observation of Goa, is 73 deg. 6 min. E. from London. The variation of the compass, by several observations, is 53 min. westerly.

Of Wooding and Watering.

There is no wood here but what is brought over in country boats, and is in very small billets: it is pretty dear, notwithstanding great quantities are brought over. The watering place is in the middle of the garrison; but the water is conducted in pipes to the Bunder, where the casks are filled in the boats, by means of leathern hose, that lead from the cocks. There is great plenty of water in the garrison.

Of Provisions and Refreshments.

There are good provisions and refreshments to be had here both for present use and sea-store; such as sheep, hogs, ducks, fowls, fresh fish, and vegetables, in great plenty; also biscuits, pease, rice, callivances, flour, arrack, and sugar; this place being plentifully supplied from Surat, and all the adjacent places, both coast-ways and from inland parts, by country vessels bringing them down the rivers in great plenty. Fresh beef is the only scarce species of provisions here: not that there is any scarcity of cattle in the country hereabouts; but the inhabitants, being Gentoos, will not sell their cattle, or suffer them to be killed; so that what fresh beef the ships are supplied with here is brought from Surat, Bencoot, and other places along the Coast; which makes it very scarce.

The situation of this Port, and its being a safe and spacious Harbour, with a good marine yard and docks fit to receive large ships, where they can be repaired with all manner of conveniency, makes it a place of great trade, and much frequented by ships to and from all parts of India. There are also a great number of ships and vessels belonging to this place. Here is an excellent dock-yard, where they build the India Company's ships of war, grabs and other vessels, having great plenty of timber, and all sorts of naval stores. Here are also two excellent dry docks, one a-head of the other: the inner dock will receive a fifty-gun ship, and the outer one a seventy-gun ship: they were building another, (1763) without the other two, which will be fit to receive a seventy-four-gun ship.

Of

Of the Monsoons, &c. on the Coast of Malabar.

I Shall now proceed to observe the time of the N.E. or fair-weather monsoon, and what kind of weather there is between the monsoons, or the breaking-up of the one, and setting-in of the other; with a particular account of the S.W. or foul-weather monsoon, or rainy season; and also point out the properest months for ships to sail up and down this Coast, and the months wherein the navigation is, in a manner, entirely stopped by the violence of wind and weather.

After the full or change of the moon, in the latter end of October, or early in November, the fair weather sets in, and puts an end to the S.W. monsoon, which is the bad-weather and rainy season. This monsoon generally breaks up with thunder and lightning: and a storm of wind comes on in the S.E. quarter, which blows violently for several hours, with abundance of rain; then veers round the compass, and moderates: so ends the S.W. monsoon. If the S.W. monsoon breaks up without a storm, as I have known it to do, then there generally happens a storm in December, as was the case in 1763.

After the N.E. or fair-weather monsoon is set in, as above, you may sail up or down this Coast with great safety, the winds then blowing from the N.W. N. to N.E. not only without storms, but without squalls, or any kind of uncertain weather; so that you may carry all your sails, night and day, without any fear of squalls, storms, &c. Indeed the weather then is so serene, clear, fair, and pleasant, that no weather, in any part of the world I ever met with, can be compared to this on the Coast of Malabar. This weather continues during the months of November, December, January, and February: therefore these are the best months for the navigation up or down this Coast.

Every day, about 11 or 12 o'clock, the wind comes from the sea, and is called the sea-breeze, which generally comes on at W.S.W. or W. a fair pleasant gale, and veers round gradually to the northward. Towards 6, 8, or 10 o'clock in the evening, sooner or later, as it happens, the wind comes off the land, sometimes after a short interval of calm between the breezes, and sometimes none. The land-winds, which blow between the N.E. and E.S.E. are sometimes but faint when they first come on, but soon increase into a fine fresh gale, which continues till 9 or 10 o'clock the next day, and then turns to light airs or calm, till the sea-breeze comes in, as above mentioned. This regularity of the land and sea breezes greatly facilitates the navigation of ships sailing up and down this Coast.

You ought, during the time of the land-winds, to take care to get a good offing, in 30 fathom water, or thereabouts, in order to make advantage of the sea-breeze. In that depth of water you will be 5 or 6 leagues off shore, in some places, more or less. Also take care to be within 2 or 3 miles of the shore by 7 or 8 o'clock in the evening, before the wind blows from thence. You may, in most places along this Coast, stand in shore to 12, 10, or 8 fathom; and, if you find yourself near the land before the wind blows from thence, you may either anchor, or make a small trip of it, as there is no current at this season.

A great regard must nevertheless be had to the currents, which, during the calm that intervenes the change of the breezes, may in a little time make you lose the advantage you have

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have gained: in that case, if you find the current sets strong against you, it is best to anchor with your coasting-anchor, and wait for the breeze, either from the land or sea. I have several times been up and down this Coast in the months of November, December, January, and February, when by experience I found little or no current; and have more than once come up this Coast, from Cape Comaroon to Bombay, in that season, without letting go an anchor, (but at the places we purposed to stop at) in 20, 21, or 22 days.

March and April.

In the months of March and April, the sea-breezes are stronger than in the 4 last months, and the land-winds are very faint, and seldom come off till the morning; the sea-wind, or rather the N.W. or north-westerly winds, continuing till then; and when the land-wind comes off, it is very scant (about N.N.E. or N.E. by N.) and is so faint, and its continuance so short, that you reap but little advantage from it, being obliged to run right off shore with it to get an offing, in order to make the most of the sea-wind, which generally comes on to the northward of west, and soon veers round to the northward; and frequently little winds and calms: and it often happens, that the sea-wind, with which you sometimes lie a tolerable flant along-shore, will induce you to stand on longer than you intended; by which means you get close in shore, in hopes to get a spirt of land-wind, to run you off again; but, perhaps, find yourself deceived: I have been several times so circumstanced, and have been as often deceived, and been obliged to stand off, with the wind at N.N.W. or N.W. very much to our disadvantage. Indeed, it may be said, that, during the months of March and April, there are little or no land-winds; therefore you must have no dependence on them. The winds blow almost for a constancy from N. by E. and N.N.E. to N.N.W. and N.W. and sometimes W.N.W. but mostly in the N.W. quarter: and at the full and change of the moon it blows very strong at N.W. with a large sea, and a strong southerly current, which makes the navigation up the Coast of Malabar, at this time of the year, very tedious; as, on the contrary, very favourable for failing down it. There are sometimes spirts of wind southerly, which continue for 3, 4, 5, or 6 hours, more or less; sometimes a fresh breeze, at other times very faint: sometimes you will have smart squalls off the land, but they are soon over. Those who are determined to sail up along the Coast, in these months, ought to keep a very good offing, as the general method will not now do; and when they stand in shore in the evening, with the sea breeze (as the wind generally northerns in the evening) instead of anchoring to wait for the land-breeze, ought to stand off again, with the northerly wind, into 30, 35, or 40 fathom water, and there anchor, in order to be ready for the next day's sea-breeze. The wind generally abates about midnight, and continues fainting away till 10, 11, or 12 o'clock the next day, when the sea-breeze comes on again. Be sure always to anchor as often as it falls little wind or calm, on account of the southerly current, and generally a swell from the N.W. This is the only method to get ground, and to keep what you have got.

To sail up the Coast to advantage.

Stretching off the Coast.

I have known several commanders of ships, who, having formerly experienced the trouble, fatigue, and tediousness, of a passage up along the Coast at this time of the year, have stretched out to the westward, and made 4, 5, or 6 deg. westing, where they have met with constant westerly winds, and made their passage to Bombay, or Surat, in half the time that ships have done, by keeping along the Coast: therefore this must certainly be the best way at this time of the year.

May.

In this month the weather is very uncertain, the winds variable, the sky frequently very cloudy, seemingly threatening much wind, squalls, and rain; though in general nothing comes of it; but it passes off in a slight shower of rain, with much lightening to the south-eastward. In this month the wind blows frequently from the S. and S.W. and sometimes very strong, especially down the Coast, to the southward of Tillicherry, where the monsoon always sets in before it does further to the northward: and it also sets in

in to the northward, at Surat and that way, sooner than at Bombay: notwithstanding the uncertainty of the weather in this month, the wind is mostly in the N.W. quarter, and frequently blows pretty fresh from thence; and then the weather is generally clear and fair; but when the wind is S.E. south, or south-westerly, which often happens, the sky is always over-cast, &c. as if a storm was coming on.

Towards the latter end of this month, if it happens to be the time of the full or change of the moon, or early in June, it is sure to bring in the S.W. monsoon and rainy weather, which generally comes on with the sky loaded with heavy clouds, threatening a violent storm; and indeed it generally comes on, in a violent storm from the S.E. with much thunder, lightening, and a deluge of rain, which continues for several days, with a prodigious great sea constantly rolling in upon the shore.

Setting-in
of the S.W.
monsoon.

During the month of May the weather is sultry hot, and almost insupportable; but more so some years than others.

As the S.W. monsoon sets in with strong gales from the S.E. the wind veers round to the south and south-westward; and indeed the wind, during this monsoon, blows mostly between the S.W. and W. and during the months of June and July the weather is so bad upon this Coast, that the navigation thereof may justly be said to be impracticable; it being almost one continued storm and tempest of wind and rain, with a great sea from the S.W. Though there are some intervals when it ceases raining, and the winds moderate a little, also the sun now and then makes its appearance; yet these intervals are generally but of a very short duration, and frequently do not happen for some days together.

In August, the monsoon being more settled, the winds more moderate, with longer intervals of fair weather, the ships that have wintered at Bombay depart thence for the Coast of Coromandel, and other parts to the eastward; though in this month there is much rain, with frequent hard squalls; and storms are much to be feared, and too frequently happen. The winds are mostly from S.W. to W. but sometimes extend to W. by N. and W.N.W.

August,

In September the weather is still fairer than in August; and indeed there is more fair weather than foul, having often fair weather for several days together, with a good deal of sun-shine: but yet you are not free from the apprehension of storms, the sky being often over-cast, and the horizon obscured with a thick haze; and sometimes you meet with heavy squalls, and much rain; with a large swell from the S.W. continually rolling in upon the shore; and in 9 or 10 fathom water the swell looks as if it was going to break. Some years there are storms and tempests in this month. The winds are much the same as in August, from S.W. to W. and W.N.W. Ships frequently sail down this Coast, from Bombay, in this month.

September.

In October the weather is much the same as in September, until the full and change of the moon, when the weather is very precarious, the monsoon generally changing the latter end of this month, or early in November, according as the full or change happens. It always breaks up in a violent tempest of wind in the S.E. quarter, with a deluge of rain, and much thunder and lightening. It is not to be understood here, that the monsoon changes exactly on the full or change of the moon, but perhaps 2, 3, 4, or 5 days before or after. In the year 1760, the S.W. monsoon broke up on the 2d of November (though the moon did not change till the 7th) with a violent tempest, in which his Majesty's ship Cumberland foundered, at her anchors, at Goa: and in 1762 it broke up on the 6th of November (it was full moon on the 1st) in the same manner; in which the Winchelsea Indiaman, having just sailed from Bombay, suffered very much, being obliged to cut away some of her masts, and throw most of her guns over-board; and great damage was done, by this storm, to several other ships that were then on this Coast. The Guardian, one of the company's cruisers, at the same time being on a cruise in the offing, lost all her masts,

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mafts, and was in great diftrefs. After the monfoon is changed, there is the fineft weather in the world, gentle gales, a fmooth fea, and as fine a temperature of air as can be wifhed for.

Directions for Ships that may be obliged to fail from Bombay in the Time of the South-West Monfoon, and bound to the Southward.

Off Bombay Harbour.

AT this feafon of the year, as foon as you have got without the Harbour of Bombay, there runs a prodigious fea, which with a ftrong ebb-tide occasions it to break, as though you were in fhool water; as we experienced in the Elizabeth (which failed from Bombay, in company with the America, Falmouth, and Chatham, on the 1ft of July, 1761, being then the very height of the S.W. monfoon) when ſhe pitched fore-cattle under, and filled both her upper and lower decks with water.

Caution
againft
anchoring.

When you have got out of Bombay, employ your utmoft endeavours to get an offing, taking all advantages of the ſhifts of wind, which you will frequently find to ſhift 2, 3, and ſometimes 4 points at a time, in the ſqualls, which you will have abundance of, with almoſt a conſtant rain; and by no means be prevailed on to come to an anchor, as we were in the before-mentioned voyage, by the advice of ſome fair-weather navigators, who, I believe, were entirely ignorant of the confequences of a ſhip's anchoring in the open ſea, at this ſtormy feaſon of the year, where they lay expoſed to the violence of both wind and ſea. Our ſhips rolled, laboured, and pitched, in ſuch a manner as I thought would have torn them to pieces. At midnight the Falmouth parted her cable, and ſtood off to ſea: we immediately made the ſignal to weigh; and it took us from midnight to day-light to purchaſe our anchor, which we at laſt did with great difficulty. We anchored in 17 fathom, being then low water. The intention of our anchoring was, to prevent the flood, which was then coming on, driving us to the northward.

Tides.

The tides are not ſtrong in the offing: we tried them every hour, whiſt at anchor; and at the very ſtrength of the tide (though it was then ſpring-tide) it ran but 6 fathom, N.E. by E. and the ebb much the ſame, ſouth-westerly.

To get an
offing.

In your endeavour to get an offing, always obſerve to ſtand on that tack you can make moſt weſting of; but at the ſame time having a ſtrict regard to the tides, and, if poſſible, to ſtand on that tack that you can beſt ſtem the tide on. We always ſtood to the weſtward with the ebb, which ſets to the ſouthward; and to the ſouthward with the flood, which runs to the northward. The tides flow on this part of the Coaſt N. and S. (12 hours) at full and change of the moon. After we were to the ſouthward of 17 deg. N. we took no further notice of the tide. The beſt latitude reckoned to get an offing, is $18\frac{1}{2}$ deg.

What courſe
to make good

When you have got an offing, and are in 35 or 40 fathom water, you may ſteer the along-ſhore courſe (if the winds will permit) making an allowance of at leaſt $\frac{1}{2}$ or $\frac{3}{4}$ of a point, for the prodigious ſwell that comes from the W.S.W. If you can make your courſe good, S.S.E. and keep your depth of water, you may depend on that courſe carrying you clear of all the Coaſt. I am well aſſured, from my own obſervation and experience of this Coaſt, that, from the Iſlands Hunary and Kanary, the Coaſt lies due S.S.E. and N.N.W. ſo that, being 5 leagues off Kanary, a S.S.E. courſe will carry you quite clear to Cape Comaroon; and you will paſs at much the ſame diſtance, from every head-land all along the Coaſt, that you were from Kanary.

Diſtance to
keep.

Although the wind ſhould favour you, as you will find it to do, as you run along the Coaſt to the ſouthward; and the further you get to the ſouthward, the more will you find

find the wind favour you; yet be not covetous to take too great an offing; and by no means go out of soundings, but keep in 40, 45, or 50 fathom, till you get into $12\frac{1}{2}$ deg. or 12 deg. N. And when you stand in towards the land, I would not advise you to come nearer than 16 or 15 fathom, as the weather is mostly very hazey at this season.

Notwithstanding you have generally a great deal of rain, and thick cloudy weather, ^{Southerly current.} throughout the whole of this monsoon; yet, for several days, towards noon, we had a sight of the sun sufficient to get an observation, whereby we found we had a strong southerly current, which favoured us 20, 22, and sometimes 26 miles in the 24 hours, more than the run gave: therefore you ought to make this allowance all along the Malabar Coast, at this season of the year, which you will find to answer, whether you have an observation or not.

Being in about the latitude of 12 deg. N. and you have 45 or 50 fathom, you may be sure that you are within the Laccadive Islands; but if you lose soundings on the Coast, you cannot be so certain, whether you are without or within them; and run a great risque of falling in amongst them, if not upon them, as the weather is generally so thick and hazey.

Soon after this you lose soundings; for further to the southward there are no ^{Of the} soundings at that distance from the shore: you may then with great safety steer ^{southerly} S. S. E. which will carry you clear, both of the Malabar Coast, and of the Laccadive Islands, to Cape Comaroon: therefore you need not now regard your soundings as heretofore; but only to have a cast now and then, to satisfy your curiosity, whether you are in soundings or not. There are good and regular soundings all along this Coast; only in some places deeper, and others shoaler water.

When you have got as far to the southward as Cape Comaroon, being then clear of ^{From Cape} all the Coast of Malabar, you may steer S. E. by S. or S. E. according as you have ^{Comaroon} the winds, till you are in the latitude of Gaula; and then steer E. for Gaula, com- ^{to Point de} monly called Point de Gall; still making allowance for a southerly current, at the rate of 18 or 20 miles in 24 hours. We ran for Gaula in the night, (having had a good observation the day before) steering E. by N. and E. by N. $\frac{1}{2}$ N. to make an allowance for the southerly current; and, with that course, kept in the parallel of Gaula, so as to get soundings in about 40 fathom; and accordingly, at 2 A. M. struck soundings in 42 fathom; then lay-to under top-sails till day-light, when Gaula bore E. by S. about 4 leagues, made sail, and coasted it round Ceylon or Zeloan, as usual. By our reckoning we passed about mid-channel between the Malabar Coast and the Laccadive Islands; but, by our soundings, much nearer the former, thereby judging ourselves not more than 12 or 14 leagues off the said Coast; but yet, on our land-fall with Gaula, found our reckonings very exact.

It is remarkable, that as soon as you get about half a degree to the southward of Cape Comaroon, you get clear of all the rain, and hazey weather; and have then a fine clear sky, and fair weather; which shews what exact bounds the rains are confined to.

As I have elsewhere given a very particular and circumstantial account of all the ports, head-lands, islands, rocks, &c. with their bearings and distance from one to the other; as also their latitude and longitude, and the soundings, and variation of the compass; with whatever else is remarkable, as experienced in our passage, up this Coast, in the months of February, March, and April, 1763; I shall refer you thereto, and proceed to the description of Gaula, and thence along the east coast of Ceylon or Zeloan, and that of Coromandel, to Madrafs and Pullicat.



A Description of all the Ports, Headlands, Islands, Rocks, &c. with their Bearings and Distance from one to the other; as also their Latitude and Longitude, and the Soundings, and Variation of the Compass; with whatever else is remarkable, from Port de Gall, or Gaula, along the Southern and Eastern Coasts of Ceylon or Zeloan, and the Coast of Coromandel, as far as Madrafs and Pullicat.

Point de
Gall.

THE land about Gaula is pretty high and hilly; whereas to the westward of it the land is low, and the point is bluff to the seaward, and rises gradually higher towards the land. A little to the westward of the said point is the Bay or Harbour of Gaula, where the Dutch have a considerable settlement, which has a good appearance from the sea, and is said to be well fortified. They do not suffer any strange ships to enter this Port, without sending them one of their own pilots, in order to reserve the knowledge thereof to themselves alone: and, indeed, strangers must prove the necessity for their going in at all, before the Dutch will give them admission.

High land.

I must here take notice, that there is, on the Island Ceylon, perhaps, the highest and most remarkable lands in the known world, which will be frequently spoke of in my Description of the Coast of Ceylon, but only with regard to their bearings, &c. The first I shall speak of is an immense high mountain, with a peak on the top of it, which is called Adam's Peak: this mountain is so high, that it is most frequently hid or covered with the clouds; therefore it is not always seen; but when the weather is clear, it may be seen an incredible distance at sea: you very frequently see nothing but the peak above the clouds: I have seen it, and have set the bearings of it 18 or 20 leagues off the Coast of Ceylon, when going from Gaula, bound for Cape Comaroon. It is said, this mountain is situated nearly in the middle of the Island Ceylon; but I think it must rather be nearest the S. W. part of the Island.

Adam's
Peak.

How far
seen.

The Hay-
cock.

There is another high remarkable hill, situated on a plain or level part of the country, resembling a hay-cock, from which it takes its name; and when it bears N. by E. $\frac{1}{4}$ E. it is right over Gaula: about 3 leagues from Gaula, with these bearings, there is 30 fathom water; from 40 to 44 about 4 leagues off; and when Gaula Flag-staff bears N. W. $\frac{1}{4}$ N. 3 or 4 leagues, and the Hay-cock N. $\frac{1}{4}$ E. you will have soundings 33 fathom, brown sand. Within 3 or 4 leagues of the shore, about Gaula, the currents are but weak; whereas, 8, 9, or 10 leagues off, they set strong to the westward.

Latitude,
&c.

The latitude of Point de Gall is 6 deg. 6 min. N. the longitude, by astronomical observation, 80 deg. 10 min. E. from London; and the variation, in the offing, 19 min. W.

Anchorage.

If you would anchor in good ground, in Gaula Road, come no nearer than 18 or 17 fathom water; the Flag-staff bearing between N. N. E. and N. E. by N. As to the anchorage within the Harbour, I need take no notice of it, for the reasons above mentioned.

Rocks.

There are 2 rocks under water, going into Gaula, upon one of which I have seen the water break very high: to the westward of Gaula there are also several straggling rocks, under water, on which the sea breaks very high likewise: you ought not to come under 25 fathom hereabouts.

The

The Coast from Point de Gall to Red Bay lies about E. by S. $5\frac{1}{2}$ or 6 leagues: and Woody I. & about a league to the westward of this Bay is a small island, covered with trees, called Red Bay. Woody Island. To the eastward of this Bay are high lands.

From Red Point (which is the easternmost point of Red Bay) to Matura the Matura Bay. coast lies E. by S. about 3 leagues. Matura is a Dutch settlement, where they have a small fort, which may be seen a great way at sea, bearing from N. N. W. to N. E. as the coast is pretty high hereabouts.

Matura Bay is very open; but you may anchor before Matura, and ride smooth enough there, in the N. E. monsoon, in 22 or 20 fathom, sand mixed with shells and ouze, Matura Island bearing N. E. $\frac{1}{2}$ N. and Dunder Head N. E. by E. or E. N. E. off shore about 2 miles. Under 20 fathom, in Matura Road, is foul ground, unless in some small spots, which the Dutch ships are acquainted with. Here you may get plenty of wood and good water.

Matura Island is small and rocky, much resembling a hay-cock, and lies right opposite the fort: behind the island is a good shelter for boats, where they come to anchor, as they cannot land on account of the surf and the shallowness of water: the Dutch send off canoes to carry people, out of the boats, on shore.

The mouth or entrance of the river is about half a mile to the westward of the fort. Boats go into the river a small distance to fill water, which is very good; but the entrance of the river is dangerous by rocks which lie under water, and the outset of the river is very strong; so that, if the boats should touch on these rocks, they would be in danger of being overset, and the people drowned: it is therefore best to have the country people to pilot them in and out; and then you may water here very expeditiously.

Matura Fort bearing N. N. W. and Dunder Head N. $\frac{1}{2}$ W. 3 leagues, there are no soundings at 90 fathom.

From Red Point to Dunder Head the course is E. by S. $\frac{1}{4}$ S. distance about $4\frac{1}{2}$ leagues: Dunder and from Matura to Dunder Head it is reckoned S. E. $\frac{1}{4}$ E. 4 or 5 miles. Off Dunder Head. Head there lies a ledge of rocks, stretching out to the S. W. by W. about $1\frac{1}{2}$ mile, upon which I have seen the sea break very high. As far as I could judge from appearances, great ships should not come within 25 fathom, the soundings being very uncertain hereabouts. Dunder Head is a low point of land, the extremity of which is very low, whereon is a large cluster of high cocoa-nut trees, which makes it easily known.

The Red Cliffs, a pretty high remarkable land, close to the sea, a little to the eastward of Dunder Head, bearing N. E. $\frac{1}{4}$ E. and the extremes of the land to the westward N. W. $\frac{1}{4}$ W. off shore about 3 leagues, there are no soundings at 100 fathom. The coast is very steep hereabouts.

A little further to the eastward of Dunder Head is the point of Gacliés, which is Gacliés a high steep land, with trees on it, by which it may be known. Point.

Nivelle is a place of some trade, and may be known by a pretty high steep point Nivelle. on the west side of it: there is on this point a large white building with a cupola, which makes it very remarkable. Off this place you will have 32 fathom, 4 miles off shore: here I saw a large Dutch ship lying in the road. You will have 52 fathom between 2 and 3 leagues off shore, without that no soundings. Off Nivelle, in 32 fathom water, in lat. 5 deg. 49 min. N. distance off shore 4 or 5 miles, you will see Gacliés Point bearing W. by N. distance 5 or 6 leagues.

Between these two last-mentioned places there is a bay, called Niebwell Bay: the west Niebwell or point thereof appears like an island, and has a row of very high cocoa-nut trees from the Niebwell B. one end to the other, by which it may be known: this point N. E. distant 3 leagues, no soundings at 50 fathom.

Between

38 *Sundry* REMARKS and OBSERVATIONS made in

Between
Dunder
Head and
the Basses.

Between Dunder Head and the Great Basses there is deep water near the Coast: you will not have soundings any where along this part of the Coast above 2 leagues from the shore, and in some places not above two or three miles off shore; therefore let none trust to their soundings along this part of the Coast in the night-time, but keep a good look-out.

How ships
steer in both
monsoons.

Ships that sail along this part of the Coast, in the S. W. monsoon, have no business in shore after they pass by Dunder Head or the Red Cliffs; but, as they have a fair wind, they always shape a course from thence to go clear of the Great Basses, which course and distance I shall have occasion to speak more particularly of hereafter: and ships in the N. E. monsoon, being off the Basses, and bound westward, having also a fair wind, shape a course from thence to the Red Cliffs or Dunder Head: a W. by S. course from the Great Basses, distance 18 leagues, will bring them fair with Dunder Head, within 4 or 5 leagues of it: but trust not too much to your course; for the currents set strong to the S. W. and will set you off the land; therefore keep the shore close a-board, within 2 or 3 leagues, there is no danger.

Ships taking their departure, as it were, from the above-mentioned places, in the different monsoons, and shaping their course as above mentioned, make this part of the Coast, between these places, very little frequented.

Winds.

I have been more than once coming this way in the month of October, and beginning of November, and have met with strong westerly winds, which obliged me to keep in with the land, and coast it along shore, which gave me an opportunity of seeing and sounding this part of the Coast: there is no place of note between the Basses and Dunder Head: but there are several places where the Dutch coasting vessels frequent, of little or no consequence; therefore I shall say nothing about them, and shall only speak of this part of the Coast, as above mentioned, with regard to the lying of the Coast, and the soundings.

The Coast
between
Dunder
Head and
the Basses.

The Coast between Dunder Head and the Great Basses lies nearest E. N. E. and W. S. W. distant 17 or 18 leagues: for this distance the shore is steep, and tolerable high near the sea, but much higher in land; and I saw nothing remarkable in sailing along in shore: but at Nivelles and Niebwell, in most places you have from 30 to 36 and 40 fathom water, 3 or 4 miles off the shore; and in some places you will find the water deepen, the nearer you go to the shore; all foul rocky ground. There are no soundings without 50 fathom, and you will have that depth not above 6 or 7 miles off shore; so that there is no dependence on the soundings: and there is foul ground and rocks, in some places, full 2 miles off the shore.

Soundings.

Distance
from Dunder
Head to
the Great
Basses.

It is reckoned 20 leagues from Dunder Head to the Great Basses. The English Pilot and the New Directory differ much in their opinions in regard to the course: the English Pilot says you should steer E. S. E. and the New Directory, that you may steer east, which will carry you 8 leagues to the southward of the Great Basses; and that he takes to be sufficient for the set of the current to the northward; but that, however, you should take care to sound from time to time. I must beg leave to differ from them both, in regard to the true course from Dunder Head to the Great Basses; it being my opinion, that a ship, 2 or 3 leagues off Dunder Head, may with great safety steer E. by N. which will carry her 4 or 5 leagues without the Great Basses; for the currents, that the French pilot, in the New Directory, seems to lay so great stress on, are very changeable, and as often set to the westward as to the eastward, and much oftener to the southward than the northward, mostly south-westerly: however, take the caution therein, in regard to the distance, which is, "You must still observe, that though it is 20 leagues from Dunder Head to the Great Basses, yet, when you reckon you have

"have failed 15 or 16 leagues, you will be opposite to it: several ships, have even "thought they had got no further than 12 or 13. This observation is worth attending to, "as well for shaping your course, as for the distance." By this caution the author seems to think, that the current generally sets to the north-eastward, by ships making the distance but 15 or 16 leagues, instead of 20, from Dunder Head to the Great Baffles. In this article I must also beg leave to differ from him. I have been several times cruising off the Friar's Hood and the Baffles in the months of July and August, being the very height of the S.W. monsoon, and always found strong south-westerly currents, which have set the ship 40, 50, 65, or 75 miles to the southward or south-westward, in 24 hours, more than the run (by log) gave. I have also coasted it this way in the months of October, November, and December, being the beginning and the middle of the N.E. monsoon; and have found the current, on an average, run 24 and 30 miles (and some days 60 or 70 miles) more to the southward than the run would give. Also in the months of February, March, and April, I have found a strong southern or south-westerly current; but not so strong as in the fore-mentioned months: and, in general, about the Friar's Hood and Baffles, the currents run more or less to the southward or south-westward, all the year round; which is sufficient to prove that the French pilot is mistaken with regard to the distance; for, instead of the currents making the distance seem less, they must rather make it seem a great deal more, since it is right against them, and therefore must certainly impede the ship's way, and cause her to run more by the log than if there was no current, as I have always experienced by my run, every time I have gone that way. I have tried the current several times, in sight of the Baffles, and also in sight of the Friar's Hood, and found it set to the S.W. by W. S.W. or S.W. by S. 2 and $2\frac{1}{2}$ knots; which will sufficiently shew the strength and set of the current about this part of the Coast of Zeloan.

The Great Baffles are a cluster of rocks, extending about $1\frac{1}{2}$ mile in length, and as The Great much in breadth: the sea breaks very high on them, and some of them are a considerable Baffles. height above water. I have been several times very near them in turning along shore. You must give them a good birth, and come no nearer them than 34 or 35 fathom, or, in the night, than 40 fathom. They lie about 3 leagues off shore. It is said there is a channel within them; but I know nothing of it. The latitude of the Great Baffles is 6 deg. 10 min. N. and the longitude, by computation, 81 deg. 45 min. E. from London; the variation 25 min. easterly.

The Elephant is a remarkable high rock near the sea, having no resemblance of that The Ele- animal, but is very remarkable, and serves as a sea-mark, &c. for there being no other phant. hill or rock near it makes it very conspicuous; and, as its situation is close to the sea, it may be seen at a great distance either from the northward or southward. It bears from the Great Baffles N. $\frac{1}{2}$ W. about 3 leagues.

When the Great Baffles and Elephant were in one, (N. $\frac{1}{2}$ W.) about 3 miles from the Soundings. Baffles, we had 35 fathom water, coarse brown sand, with shells: Chimney Hill then bore N.N.E. about 4 leagues; and, when the Elephant and Great Baffles were in one, distant from the Baffles 5 or 6 miles, we had 38 fathom, coarse brown sand, with shells. The Elephant bearing N. $\frac{1}{4}$ E. and the Great Baffles N. by E. $\frac{1}{2}$ E. 4 or 5 miles, distance off shore about 3 leagues, we had 39 fathom, brown sand and shells: we sounded every quarter of an hour, and, as we were standing W.N.W. the next cast had 25 fathom; then 14 fathom, brown sand: tacked ship to the southward, the Great Baffles bearing N.N.E. 4 or 5 miles, and the distance off shore 5 or 6 miles: I would therefore advise the keeping further off shore hereabouts. The Elephant N. by W. about 5 leagues, had 50 fathom, brown sand: the Great Baffles N. $\frac{1}{2}$ E. about 3 leagues, had 34 fathom, dark-grey sand.

By

40 Sundry REMARKS and OBSERVATIONS made in

From the
Great to
the Little
Baffles.

By working the course and distance from the Great to the Little Baffles, and from what I could observe every time I sailed this track between them, I find that by steering N. E. $\frac{1}{4}$ E. and S. W. $\frac{1}{4}$ W. you will sail no farther from one than the other, and consequently that they bear thus one of the other: the distance about 7 leagues. You may coast it along, between the Baffles, about $3\frac{1}{4}$ or 4 leagues off shore, in 35 or 36 fathom water; though there is no trusting to your soundings hereabouts.

The Little
Baffles.

The Little Baffles are rocks under water, no part of them being seen; but the sea generally breaks on them very high: however, should the sea be so uncommonly smooth as not to break on them, keep the Elephant W. $\frac{1}{4}$ or $\frac{1}{4}$ N. until you bring Chimney Hill to bear W. N. W. $\frac{1}{4}$ W. when you will be clear to the northward of them. By the appearance of the breakers I imagine they may be about a mile in length, and as much in breadth; and seem to lie about 2 or $2\frac{1}{4}$ leagues from the shore: they are the more dangerous as there is deep water close to them, having no ground with 30 fathom, and next cast 16 fathom, within half a mile of the breakers.

Chimney
Hill.

To know when you are near the Little Baffles, there is a pretty high peaked hill on the shore, near the sea, without any other hill near it; on the north side of which, near the top, there is a remarkable rock, standing right up, resembling a chimney, which occasions its having the name of Chimney Hill. When Chimney Hill is on with the breakers of the Little Baffles, it bears exactly N. W. and when the breakers of the Little Baffles and the Elephant are in one, they bear W. $\frac{1}{4}$ S.

Soundings.

When Chimney Hill bore W. by N. and the Little Baffles S. W. distance off shore 7 or 8 miles, we had 19 fathom water; tacked to the eastward, and made our way about E. S. E.

Current.

4 miles, and had no ground with 50 or 60 fathom of line; at the same time tried the current, and found it set S. W. by S. $1\frac{1}{4}$ knot.

Pagoda Hill.

A little to the northward of the Chimney Hill, and inland withall, you see another hill, not quite so high, which has upon the top, or near the top, on the north side of it, a rock rising up in the same manner as that on Chimney Hill, but much larger, resembling, in the opinion of most navigators, a pagoda, from whence it derives its name; but I think it rather resembles a castle. It is not to be distinguished from other hills, but by this mark; and when Chimney Hill bears N. W. it is then touching the north foot or part thereof; and when Chimney Hill bears N. W. $\frac{1}{4}$ N. the Pagoda Hill is shut in with it. The land hereabouts is high broken land; many hills, and mountainous.

Julius Nave.

There is a high white sandy point, close to the sea, called Julius Nave, bearing about N. N. W. $\frac{1}{4}$ W. from the Little Baffles, and distant about 3 or $3\frac{1}{4}$ leagues.

Friar's
Hood.]

There are a great number of remarkable mountains in land on this part of the Island Zeloan; but the highest, and most remarkable, is one by navigators called the Friar's Hood, on account of its resembling, at its extremity, a friar's hood; but it makes only in this form whilst it bears from W. to S. for, when it bears N. W. or W. N. W. its peak is like the top of a pyramid.

Latitude,
longitude,
variation &
current.

As the Friar's Hood is a part of Zeloan, which ships often fall in with, and as often take their departure from, I ascertained its latitude to be 7 deg. 16 min. N. being at an anchor in 22 fathom, about 2 or 3 leagues off shore, and the Friar's Hood bearing pretty near west. I likewise ascertained, by computation, the longitude of the sea-coast in the parallel of the Friar's Hood; for that being a great way in land, its longitude is not so material as that of the land near the sea, which I found, by carefully working the course and distance from Trincomalay to that part of the land where the Friar's Hood bore west, to be 82 deg. 8 min. E. from London; and where we found the current set S. by E. $\frac{1}{4}$ knot; the variation 35 min. easterly.

There

There is another mountain, to the southward of the former, which is not quite so high, ^{False Hood.} and is called the False Hood, as it bears a great resemblance to the true hood, and indeed is sometimes mistaken for it.

Being 4, 5, or 6 miles off the Little Baffles, you may steer N. N. E. 9 or 10 leagues, ^{From the Little Baffles to Aguin Hill.} keeping in 30 to 25 fathom; which course and distance will bring you a-breast of a hillock, near the sea-side, called Aguin, or Aganis, which has a small peak like a tower; and a little to the northward of the said peak, but further in land, lie 2 small hummocks near each other. Aguin is the last high land you see near the sea, until you come to Trincomalay; the land all the way between them being one entire low and flat plain, both to sea-ward and in land; and nothing remarkable to be seen, but the Sugar-Loaf Hill, which is a great way in the country, and seems to be in the middle of the plain, and 2 other small hills much further in the country than the Sugar-Loaf.

When the Pagoda Hill and the Peak of Aguin are in one, W. by S. distance off shore about 3 leagues; then the extremes of land to the northward bore N. $\frac{1}{4}$ W. and had 20 fathom water.

Being 2 $\frac{1}{2}$ or 3 leagues off Aguin, you may steer N. $\frac{1}{4}$ E. or a N. course, along shore, ^{From Aguin to Batacalao} in between 20 and 25 fathom water. The distance from Aguin to Batacalao is 18 or 19 leagues: you find nothing remarkable between them, the land being all extremely low and flat, as above mentioned. I have often tried the currents hereabouts, and found little or none; sometimes setting to the northward, and sometimes to the southward.

You may coast it along shore, from the Little Baffles to Batacalao River, at the distance of ^{From the Little Baffles to Batacalao River.} 5, 6, or 7 miles; and have soundings from 40 to 30, and from 30 to 20, and sometimes 17 or 18 fathom; but mostly between 25 and 30 fathom.

It is necessary to observe, that no regard should be paid to the irregular soundings in this part of the Island Zeloan. There are holes in several places, which I have experienced every time I sailed this way: having from 18 to 20 fathom, suddenly had 60 or 70 fathom; sometimes 100 fathom, or perhaps no ground; and afterwards, in 2 or 3 casts, have had 40, 30, 25, or 20 fathom, as it might happen. Those who coast it about this Island, ought to observe this, and not be surprised when it happens; and also the currents, which sometimes set on shore, as well as off shore.

Batacalao is known by the mouth of a small river, which you cannot see till you are ^{Batacalao.} to the northward of it: it is very narrow, and turns short round to the southward, and parallel to the beach along shore: on the north side of the entrance the Dutch have a small factory-house, with a flag-staff on it, by which also this place may be known. The land hereabouts is still very low, as before mentioned. When the Friar's Hood bears S. W. $\frac{1}{4}$ W. you are off Batacalao.

I have passed Batacalao several times in the day-time, within 2 or 3 miles of it, and had ^{The Reef not seen.} 19, 20, and 22 fathom water, but saw nothing of the reef that both the French and English talk so much of: we kept our lead constantly going, and a good look-out, with fair weather and smooth water, yet saw nothing of it.

From Batacalao to Vendelos Bay the Coast lies N. W. by N. distant about 9 leagues: ^{From Batacalao to Vendelos B.} the land between them is low and woody. Small ships may coast it in 10 or 12 fathom; but great ships must keep out in 20 and 25 fathom, 2 or 3 leagues off shore; which will carry them clear of all danger.

Vendelos is a small bay on the north side of a steep rocky point of land: it may ^{Vendelos B.} be known by a small hillock, which lies a long way in land, and seems to be in the middle of the plain, as before mentioned: this hillock is called the Sugar-Loaf, from the great resemblance it has to the top of a sugar-loaf broke off. When the Sugar-Loaf bears W. $\frac{1}{4}$ S. you are off Vendelos Bay. To the southward of the Sugar-Loaf, at some ^{Sugar Loaf.} distance,

42 *Sundry REMARKS and OBSERVATIONS made in*

distance, are 2 or 3 other hillocks; but they are further in the country, as before mentioned, in the paragraph from the Little Basses to Aguin Hill.

Observe, that ships bound to the northward, in the S. W. monsoon, should keep this coast close on board; for, if once they get off from the land, they will not easily regain it. In shore hereabouts there is little or no current; but, if a ship once gets off from the land, they will find a strong current setting to the N. N. E. which will prevent their getting hold of the land again.

From Ven-
delos to the
I. Provedien

From Vendelos Bay to the Island Provedien (or Providence) the course is N. N. W. $\frac{1}{2}$ W. or N. N. W. $\frac{3}{4}$ W. $3\frac{1}{2}$ leagues: the land between them lies rounding in a bight; and the ground all along foul, which makes it bad anchoring: hereabouts also the soundings are irregular, shoaling or deepening 2 or 3 fathom at a cast. I once had occasion to make a tack or two in shore here, and found the bottom rocky, and the soundings irregular, from 22 to 17 fathom, 4 or 5 miles off shore. Keeping in between 20 and 24 fathom, 2 or 3 leagues off shore, carries you clear of all danger.

I. Provedien

The Island Provedien is a white rock close to the shore, and makes like the sail of a sampan; so that it may be easily known. I have taken it for a sail when within 3 or 4 miles of it. The coast hereabouts is low and woody; to the sea-ward it is steep, iron-coloured rocks. The coast continues foul for 3 or 4 leagues further to the northward.

From the Island Provedien to the S. E. point of the great Bay of Trincomalay, (called by the English Pilot Foul Point, and in the New Directory the Point of Cataris) the course is N. N. W. $\frac{3}{4}$ W. distance 7 or 8 leagues. The coast is low and woody, and there is a fine white sandy beach all the way between these places. By keeping in from 18 to 22 fathom, 3 or 4 miles off shore, you go clear of all danger.

From Bata-
calao to Foul
Point.

From Batacalao to the S. E. point of the great Bay of Trincomalay, or Foul Point, as I shall hereafter call it, the coast lies N. N. W. $\frac{3}{4}$ W. distance 18 or 19 leagues. Being 3 or 4 miles off Batacalao, by steering this course it will carry you clear of all danger: or, keeping in between 20 and 25 fathom, you will pass 3, 4, or 5 miles from the shore.

Foul Point.

Foul Point is low and even, covered with trees. Three or four leagues to the southward of this Point is good anchorage, about 2 miles off shore, in 14 or 15 fathom water; and no danger if you go into 10 or 12 fathom. A clear sandy bottom from 4 leagues all the way to the Point. I have sounded all hereabouts. From Foul Point there is a dangerous shoal runs out to the N. N. E. at least a mile and a quarter, being all rocky and foul ground, which gives it the name of Foul Point. Come no nearer this Point than 14 or 15 fathom. When Round Island is a sail's breadth open to the southward of Marble Point, you are clear of all danger off Foul Point.

Mark to
clear it.

Foul Point
to Flag-staff
Point.

From Foul Point to the Flag-staff Point at Trincomalay, the course is N. W. $\frac{1}{2}$ W. distance 8 or 9 miles. You will carry soundings from Foul Point $\frac{1}{3}$ of the way toward the Flag-staff Point, from 15, 20, 30, 35, and 40 fathom; then no ground, until you come within a mile of the Flag-staff Point, when you will have soundings at 45 or 50 fathom, and shoal gradually as you approach the shore.

Flag staff P.

The Flag-staff Point is a very high steep bluff Point: at the top thereof the Dutch hoist a flag, which may be seen a great way at sea. There is no danger near this Point: you have 17 or 18 fathom within a ship's length of it.

What I may have to say concerning the Bay and Harbour of Trincomalay, I shall postpone for the present, and give a particular description thereof in a chapter by itself, to which I refer you.

Flag-staff
Point to
Pigeon I.

Being 3 or 4 miles to the eastward of the Flag-staff Point, a N. N. W. course will carry you clear of Pigeon Island, which you may pass at 2 or 3 miles distance, in 22 or 23 fathom. The distance between Flag-staff Point and Pigeon Island is 12 or 13 miles.

From

From the land a-breast Pigeon Island to Point Pedro, the Coast lies N. W. by N. a little westerly, distance 25 or 26 leagues; the Coast low and even, covered with trees; and good clear anchoring-ground all the way: but you must be careful of several shoals that lie off this part of the Coast. The shoal of Molle Valley lies 3 leagues off shore, with 3 and $2\frac{1}{2}$ fathom water upon it. Between Molle Valley and Point Pedro there is another shoal, about 2 leagues off shore, with only 2 fathom; and E. by N. $2\frac{1}{2}$ or 3 leagues off Point Pedro, lies a dangerous rock, with only 9 feet water on it, according to the New Directory; also a bank of sand $3\frac{1}{2}$ or 4 leagues off shore, with very unequal soundings on it, and is dangerous for ships to come near it: therefore you should be very cautious in sailing along this part of the Coast, and keep your lead constantly going.

From Pigeon Island, to clear the shoal of Molle Valley, the course is N. N. W. To clear 10 or 11 leagues, taking care to keep in from 18 to 20, 22, or 24 fathom. Having run N. N. W. 10 or 11 leagues, and you are in 19, 20, or 22 fathom, you may then steer N. N. W. $\frac{1}{2}$ W. or N. W. by N. 14 or 15 leagues, according as you find you deepen or shoalen your water, taking care to keep in from 20 to 24 or 25 fathom; having as much regard to the depth of water as the course steered. The above course, distance, and depth of water, will run you clear of all danger from, and bring you a-breast of, Point Pedro.

Point Pedro is very low land, with only shrubs and brushes on it; and runs out into the sea in such a manner, that at some distance it looks like the wrecks of old ships in the water. In this manner I have seen it very plain from the deck, (being becalmed a little to the southward of Point Pedro) and had no ground with 100 fathom of line; then next cast, in $\frac{1}{2}$ an hour, had 50 fathom, and then 40 fathom; soon after, coming on a light air at north, stood W. N. W. 4 miles, and had from 40 to 30, 20, and 15 fathom, when in the latitude of about 9 deg. 30 min. N. the extremes of the land from W. by N. $\frac{1}{2}$ N. to S. distance off shore about three leagues: then steered out N. N. E. till we deepened our water to 20 fathom: then steered N. N. W. till we had 26 fathom: then N. N. W. $\frac{1}{2}$ W. till we had 30 fathom: then steering N. W. and N. W. by W. for Negapatam, had no soundings.

The latitude of Point Pedro is 9 deg. 48 min. N. the longitude, by computation, Lat. &c. from that of Trincomalay, 80 deg. 51 min. E. from London; the variation 25 min. easterly.

Being a-breast of Point Pedro, in 20 or 24, you will soon deepen your water to 28, 30, 35, 40, and 50 fathom; and then no ground. When you have deepened your water to 30 or 35 fathom, you may haul up N. W. or N. W. by W. in order to get hold on the Coromandel Coast, about Negapatam; and about mid-way you will lose soundings. I have several times worked the course and distance between them, and found it N. 42 deg. W. 27 or 28 leagues.

In crossing from Zeloan to the Coast of Coromandel, ships should be very careful to keep well to the westward, and make the land about Negapatam, on account of the westerly winds, which blow very strong off this part of the Coast, in the S. W. monsoons, and prevent ships making the Coast where they intended; and there frequently are very strong northerly currents, which will horse a ship to the northward in a surprising manner. I have heard of many ships, which, by not observing this precaution, have been drove to the northward of their designed port, before they could get hold of the Coast; by which means they have lost a great deal of time, and been put to many inconveniences.

We always, by observing the directions above given, fell in exactly with Negapatam. I have seen, from the deck, the flag on the high black pagoda, a little to the

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the northward of the town, called the Chinese Pagoda, in 14 or 13 fathom, bearing W. N. W. 5 or 6 leagues; and this is the first thing to be seen about this part of the Coast, the land being very low, though it is covered with trees; and to the southward of the town is a thick wood, higher than the rest of the trees along this part of the Coast. The highest of the 5 pagodas, which are to the northward of Negapatam, is also very high, and being white may be seen a great way at sea: I have seen it much about the same distance as the former, bearing W. N. W. in 14 fathom: when first seen, they look like so many sail of ships. I have seen the land about Negapatam, from the mast-head, in 35 fathom. Without 40 fathom you have no soundings; and from 36 to 40 fathom, or no soundings, it is not more than 2 or 3 miles.

Negapatam. Negapatam is the most considerable place belonging to the Dutch on the Coast of Coromandel, and has a considerable trade, though very few vessels belonging to the place. The fort is a square, regularly fortified; and has a good ditch, with water, surrounding it. The town lies to the northward of the fort; and to the southward of the fort there is the mouth of a small river, capable of receiving small country vessels: on the north side of the entrance of this river is a battery of 14 guns, to which boats, that enter the river, must go within the length of their oars; and the landing-place is close to it. There is a bar at the mouth of the river, which, in bad weather, breaks very much, and makes it dangerous for boats to go over it. We used to anchor in Negapatam Road in 7 fathom, clear and good holding ground; the flag-staff bearing W. $\frac{1}{2}$ S. and the highest of the 5 pagodas N. W. $\frac{1}{4}$ N. off shore $2\frac{1}{2}$ or 3 miles. The watering-place is about $\frac{1}{2}$ a mile up the river, at a great tank, entirely commanded by the fort. It would be both troublesome and tedious watering here, without the assistance of the natives, and their boats. Fresh provisions for present use may be had here, with other refreshments, vegetables, fruit, &c. sufficient to supply a squadron of men of war; but no kind of sea-provision but rice; and fire-wood is a scarce article. The latitude of Negapatam is 10 deg. 50 min. N. and its longitude from London, computed by the astronomical observation at Pondicherry, 79 deg. 52 min. E. the variation 30 min. W.

The shore is very flat off Negapatam; and I have been told, that when Negapatam Flag-staff bears N. N. W. about 3 leagues, there is a shoal with only 3 fathom water on it: as to my part, I never could find it: however, it is best to keep your lead going, and a good look-out, when you come thereabouts. There is less current off this part than any other of the Coast of Coromandel: the current generally goes with the wind, and increases as you go to the northward.

From Negapatam to Calderoon, the coast lies due north and south, 13 or 14 leagues: the Coast low and woody, and all the way free from danger, till you come to Calderoon; with regular soundings as you approach the shore. There are no soundings without 45 and 50 fathom: beyond that depth the bank goes off suddenly to no soundings: in that depth you will be 6 or 7 leagues off the land: in 40 fathom you will be about 5 leagues off; and it shoalens gradually towards the shore to 10 or 11 fathom, when you will be about 3, 4, or 5 miles off shore. You may coast it all the way in 11 or 12 fathom, at about 2 leagues off shore, till you come to the reef of Calderoon, when you must keep out in 14 or 15 fathom, there being 12 fathom close to the reef.

Karycal. About 4 leagues to the northward of Negapatam is the River Karycal, where the French had a settlement, which was taken by the English in the year 1760. It has a very high flag-staff, by which it may be known.

Trankabar. Two leagues to the northward of Karycal is Trankabar, the chief settlement belonging to the Danes in the East-Indies. The fort is remarkably white, by which it may be known at a distance.

In sailing along shore to the northward, between Trankabar and Calderoon, you will see 2 small pagodas near each other, in land up in the country. Two Pagodas.

Calderoon is known by a thick bushy wood, close to the sea, which appears higher than any of the land thereabouts; and at a distance at sea it makes like a low island, whose greatest height is in the middle, and its extremities low, by which it may be known. Calderoon.

At the back of Calderoon Wood are 4 very large high pagodas, called the Chillambrum Pagodas. These pagodas, when just touching the south part of Calderoon Wood, bore W. $\frac{1}{4}$ N. at the same time had 25 fathom about 3 leagues off shore. When they are on the middle of the wood, they bear due west, by which Calderoon may be known: but if you are well in shore, the wood will prevent your seeing the pagodas, till you open them to the northward, when they will bear W. by S. $\frac{1}{2}$ S. The north part of Calderoon Wood forms a point of land, occasioned by the River Davecotta coming out there, especially when you come from the southward, and sail near shore; because the coast, whose direction was hitherto north, forms an elbow here, and trenches away N. N. W. $\frac{1}{4}$ W. and N. W. by N. $3\frac{1}{2}$ leagues as far as Porta Nova.

From the mouth of Davecotta River extends a bank or shoal, which reaches $4\frac{1}{2}$ or 5 miles from the shore, and stretching along to the southward, joins to the shore about the south part of Calderoon Wood. Calderoon Shoal. This shoal is steep to, and therefore the more dangerous, so as from 11 or 12 fathom you will, in some places, fall suddenly into 3 or 4 fathom. I have several times stood well in with this shoal, and had a good view of it: a great part of it is dry, and the sea generally breaks very high upon it. I have stood in the day time into 11 $\frac{1}{2}$ or 12 fathom, seemingly about a mile from it; and a sloop, a small distance a-head of us, had only 4 fathom, on which tacked immediately. I would not advise a great ship to come nearer this shoal than 15 or 16 fathom in the night, nor 13 or 14 in the day. His Majesty's ship Falmouth narrowly escaped being lost on this shoal, in the night: they were standing in for it, and intended to tack in 12 fathom; but missing stays, they were in 4 $\frac{1}{4}$ fathom before they could put about, and were obliged to anchor: in the morning, the weather being moderate, they warped off, and came to sail. I have been in 11 $\frac{3}{4}$ fathom about 1 $\frac{1}{2}$ mile off the north part of this shoal, when the flag-staff at Porta Nova bore W. by N. $\frac{1}{2}$ N. and the two middlemost of the 4 Chillambrum Pagodas in one W. S. W. and could see numbers of black people on the shoal a fishing: this is a pretty good mark for the north part of this shoal; but a ship bound into Porta Nova must bring the 2 middlemost pagodas, open to the northward, to bear W. S. W. $\frac{1}{4}$ S. and Porta Nova Flag-staff W. by N. $\frac{1}{4}$ N. when you are clear to the north part of the shoal, which lies about 5 miles off shore, and may haul in for Porta Nova; or, if in 18 or 20 fathom, you may haul in for it when the flag-staff bears W. N. W. and when the southernmost of the Chillambrum Pagodas is on with the south part of Calderoon Wood, you are a-breast of the south part of this shoal; but this does not lie far off shore. Note, the water shoalens faster on standing in towards Calderoon, and deepens faster in standing off it, than any other part of the coast.

Porta Nova is an Indian town of considerable trade, where the Dutch have a factory, on which they hoist their flag. Here is a small river navigable only for small country vessels; and fresh water to be filled out of a tank, a little way up the river; but it is bad and brackish, as several of our men of war experienced, which came up from Cuddalore to this place to water, till they found the bad effects of it, from its giving the people the flux, &c. Porta Nova Road is by much the smoothest and safest on all the Coromandel Coast, so that there is little or no current in this road: and the bottom is clear, muddy, and good holding ground. Its smoothness is occasioned by the Calderoon Shoal, to the south-eastward of it, which shelters it from the great swell that you find in every other part

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- part of the coast. You may anchor in Porta Nova Road in 6 fathom water, the flag-staff at Porta Nova W. $\frac{1}{2}$ N. and the southernmost of the 4 pagodas at Chillambrum S. W. $\frac{1}{4}$ W. off shore 2 miles. The latitude of Porta Nova is 11 deg. 32 min. N.
- Latitude. $\frac{1}{4}$ W. off shore 2 miles. The latitude of Porta Nova is 11 deg. 32 min. N.
- From Porta Nova to Fort St. David's. From Porta Nova to Fort St. David's, belonging to the English, the coast lies N. by E. 6 leagues: you may coast it along shore hereabouts in 8, 9, or 10 fathom, about a league off shore. A little to the northward of Porta Nova begin the white sand hills, which extend along the coast near the sea. At a distance this part of the coast resembles several islands, the sand-bank near the sea being higher than any other part of the coast, which is exceeding low. About 3 miles to the southward of Fort St. David's are the town and river of Cuddalore. The river is shallow, with a bar, and fit only for boats to enter. We lay several months in Cuddalore Road, during the blockade of Pondicherry, and anchored in 6 $\frac{1}{2}$ fathom, clear and good holding ground; Cuddalore Bar W. S. W. the flag-staff N. W. $\frac{1}{4}$ N. the ruins of Fort St. David N. N. W. $\frac{1}{2}$ W. off shore 1 $\frac{1}{2}$ mile; the current setting to the northward at the rate of a mile an hour, as it always does, off this place, in the S. W. monsoon. Here we were supplied with plenty of fresh provisions, vegetables, fruit, and other refreshments.
- Cuddalore. are the town and river of Cuddalore. The river is shallow, with a bar, and fit only for boats to enter. We lay several months in Cuddalore Road, during the blockade of Pondicherry, and anchored in 6 $\frac{1}{2}$ fathom, clear and good holding ground; Cuddalore Bar W. S. W. the flag-staff N. W. $\frac{1}{4}$ N. the ruins of Fort St. David N. N. W. $\frac{1}{2}$ W. off shore 1 $\frac{1}{2}$ mile; the current setting to the northward at the rate of a mile an hour, as it always does, off this place, in the S. W. monsoon. Here we were supplied with plenty of fresh provisions, vegetables, fruit, and other refreshments.
- Latitude, Longitude, &c. The latitude of Fort St. David's is 11 deg. 48 min. N. longitude, computed from the astronomical observation of Pondicherry, 80 deg. 11 min. E. from London; and the variation 30 min. W.
- From Fort St. David's to Pondicherry. From Fort St. David's to Pondicherry the coast lies N. N. E. $\frac{1}{2}$ E. 4 $\frac{1}{2}$ leagues: You may coast it along between them in 10, 12, or 14 fathom, 4, 5, or 6 miles off shore. In the offing you will have from 38 to 40 and 42 fathom, 5 or 6 leagues off shore, and without that no soundings. There is nothing remarkable between them: to seaward the land is low and sandy, and woody in land.
- From Fort St. David's to Sadrafs the coast lies N. N. E. $\frac{1}{2}$ E. 21 leagues.
- Pondicherry. Pondicherry was the chief of the French settlements in India, the residence of the governor-general and head council, and, before it was destroyed by the English, was by much the largest and most beautiful European settlement in India, affording a most delightful prospect from the sea: the latitude of Pondicherry is 11 deg. 58 min. N. and its longitude, by several astronomical observations, 80 deg. 15 min. E. from London; the variation 30 min. W. Some distance in land, there is a remarkable black land on a flat hill, with a grove of trees on it, higher than any other part of the coast or country hereabouts, which is the first thing you will see on this part of the coast, coming in from sea, and by which you may know Pondicherry: we called them the Tuft of Trees in land from Pondicherry: when on with the middle of Pondicherry, bearing W. $\frac{1}{2}$ N. 2 $\frac{1}{2}$ or 3 leagues, we had 15 fathom; and W. by N. 5 leagues, we had 38 fathom: there are no soundings without 40 or 42 fathom, for then the bank goes off very suddenly. The French ships generally anchored right off the town in 7 or 8 fathom, about $\frac{3}{4}$ of a mile, and small ships in 5 or 6 fathom, $\frac{1}{2}$ a mile off shore. We anchored in 10 fathom, the flag-staff W. $\frac{1}{2}$ S. and the tuft of trees on the high land at the back of Pondicherry W. N. W. off shore 2 $\frac{1}{2}$ miles; the bottom clear, and good holding ground. In June the current sets N. by E. 1 knot, sometimes more or less: to the northward of this place, and close to the north bastion, is the entrance of a river capable of receiving pretty large country vessels over its bar, which made it very convenient for trade.
- Anchorage. French ships generally anchored right off the town in 7 or 8 fathom, about $\frac{3}{4}$ of a mile, and small ships in 5 or 6 fathom, $\frac{1}{2}$ a mile off shore. We anchored in 10 fathom, the flag-staff W. $\frac{1}{2}$ S. and the tuft of trees on the high land at the back of Pondicherry W. N. W. off shore 2 $\frac{1}{2}$ miles; the bottom clear, and good holding ground. In June the current sets N. by E. 1 knot, sometimes more or less: to the northward of this place, and close to the north bastion, is the entrance of a river capable of receiving pretty large country vessels over its bar, which made it very convenient for trade.
- From Pondicherry to Sadrafs. From Pondicherry to Sadrafs the coast lies N. N. E. $\frac{1}{2}$ E. distance 16 leagues: the coast is low, with some sand-hills; and in land it is woody. About 9 leagues to the northward of Pondicherry, on the same course, are the ruins of Allem-Parva, formerly a French settlement, but destroyed by the English. You may coast it along to Allem-Parva, in 10, 12, or 14 fathom, 4, 6, or 8 miles off shore; in the offing, 38, 40, or 44 fathom, 5, 6, or 7 leagues off shore; and without that, no soundings: the bottom sand and gravel.
- Allem-Parva. From

From Allem-Parva you may see the high land of Sadrafs, a chain of high mountains, some of which are very ragged, up in the country at the back of Sadrafs: the coast between them lies N. N. E. $\frac{1}{2}$ E. 7 leagues. You may coast it along shore in 10, 11, or 12 fathom, at 5, 6, or 7 miles off shore. In the offing you have from 30 to 40 and 45 fathom, coarse brown sand and gravel, 5 or 6 leagues off shore: the high land of Sadrafs N. W. 4 or 5 leagues, 30 fathom: the flag-staff W. S. W. 3 leagues, 25 fathom: the flag-staff N. W. $\frac{1}{2}$ N. 3 or 4 leagues, 30 fathom: no soundings without 45 fathom. When the south part of the high land of Sadrafs bears N. W. then Sadrafs bears W. About $2\frac{1}{2}$ or 3 leagues to the southward of Sadrafs there is a thick wood extending about 2 or 3 miles to the northward: off this wood the water is shoaler than either to the northward or southward thereof: it is best therefore to keep a little further off shore hereabouts, in 11 or 12 fathom. About 5 or 6 miles to the northward of the above wood there is another thick wood, which, as you come from the southward, seems to run out into the sea, and form a point of land: from the southern part of this thick wood you may see Sadrafs, a Dutch settlement with a high flag-staff, which shews the flag over the trees, whereby it may be seen a long way at sea: were it not for this, Sadrafs would not be easily discovered, on account of the thick wood that surrounds it.

From Sadrafs to Madrafs the coast lies N. by E. 12 or 13 leagues: the land near the sea is low and woody, but several high mountains in land. The Coast from Sadrafs to Cabelon, and to the northward thereof, is steeper to, and deeper water, than off Sadrafs, or to the southward of it. You may coast it along shore from Sadrafs to Cabelon in 20, 22, or 24 fathom, 4, 5, or 6 miles off shore; and in the offing you have from 30 to 40 fathom, 4 or 5 leagues off shore; and without that, no soundings. About $2\frac{1}{2}$ or 3 leagues to the northward of Sadrafs are the Seven Pagodas, which are thus situated; there are 2 pagodas near the sea, 4 in the valley near the foot of the southernmost high land, and 1 on the very pitch thereof: the sight of those in the valley is often intercepted by the woods, especially when they bear about west. From the Seven Pagodas to Cabelon the coast lies N. by E. a little easterly, distance 5 leagues. You may coast it along shore between them in 18, 20, 22, or 24 fathom, at 4, 5, or 6 miles off shore. In the offing you have from 30 to 40 fathom, at 4 or 5 leagues off shore; and without that, no soundings. Cabelon is a Portuguese factory-house, on which they hoist their flag; and the house is very white, by which it may be known. From Cabelon to the town and church of St. Thomas course is as the coast lies, N. by E. $3\frac{1}{2}$ leagues. This also is a Portuguese town, situated close to the sea; and the church stands quite upon the beach, by which it may be known. You may coast it between them in from 20 to 15 or 14 fathom, distance from 6 to 3 miles off shore. In the offing you have from 30 to 40 or 44 fathom, at 4, 5, or 6 leagues distance; and without that, no soundings. In land there are high mountains, the northernmost of which is the lowest, and is to be known from any others round it by being a lower and flatter hill, with a church built at top of it, which is plainly to be seen, sailing along shore; and this is called St. Thomas's Mount. From the town or church of St. Thomas to Madrafs the coast lies N. by E. 3 miles. You may coast it in 10, 11, or 12 fathom water, 2 or 3 miles off shore. About half way between them is a remarkable high black pagoda.

Madrafs is the chief English settlement on the Coromandel Coast, being the seat of a superior governor and council, and is very well fortified for that part of the world. It is a place of great trade, though few or no ships belong to it, and is divided into the White and Black Town; the former of which is small, but well built, and stands within the walls of the garrison; the Black Town is considerably larger, and lies to the northward of the fort. Here a small river, over which there are two bridges, empties itself to the southward of the

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Latitude,
long. &c.

Anchorage.

the town, forming an elbow in its course from the northward; whereby it surrounds most part of the fortifications, which adds greatly to the strength of the place. The watering-place is about $1\frac{1}{2}$ mile to the northward of the fort; but your ship must be watered by the country boats, as none other can land, on account of the great surf; and they are often overfet in it. The latitude of Madrafs, by several observations, is 13 deg. 8 min. N. Its longitude, computed from the astronomical observation at Pondicherry, is 80 deg. 44 min. E. from London; the variation 25 min. W. The road is bad and open, where you lie exposed to all winds that blow, with a large swell perpetually rolling in upon the shore; which makes ships to labour very much in this road. The best marks for anchoring are, the flag-staff and the cupola of the town-clock in one, N. W. by W. St. Thomas's Mount S. W. $\frac{1}{2}$ W. and the high black pagoda W. S. W. in 10 fathom, off shore $1\frac{1}{2}$ or 2 miles: the bottom is muddy, and good holding ground; though further to the northward it is reckoned foul, there being many wrecks, lost anchors, &c. I have known many ships spoil their cables in this road. There is generally a northern current in the S. W. monsoon, and a southern one in the N. E. monsoon, at some times running very strong, at others little or none. Here is to be had plenty of all sorts of provisions and refreshments for a fleet of men of war, or other ships; the country hereabouts being extremely beautiful, pleasant, and plentiful, and affording a most charming prospect: but wood is a very scarce article. The landing-place is at the sea-gate; but the surf breaking very high on the shore, makes it very dangerous landing, the surf being greater here than at any other part of the Coast of Coromandel, that I was ever at. The manner of landing is thus: the ship's boat anchors just without the surf, where what they call the bar-boats come and take out the passengers or goods, and carry them through the surf, and bring them on shore. These boats are sometimes overfet, and many people drowned, and goods lost.

As at this time we went no further to the northward on the Coast of Coromandel; and, according to my original design, not intending to give any description of those parts where I have not been; yet, as in a succeeding voyage, from Diego Rayes to Madrafs, we fell in with Pullicat, off which there is a very dangerous shoal; I shall therefore in this place proceed to give some account thereof, and so conclude this description of the Coast of Coromandel.

Pullicat.

From Pullicat to Madrafs the coast lies S. by W. $\frac{1}{2}$ W. distance 7 or 8 leagues. You have from 18 to 14 fathom water, 3 or 4 miles off shore; and 30 to 35 fathom, sandy ground, 3 or 4 leagues off shore. The land near the sea is low and woody; though, in some places, the trees being pretty high make the land appear, at a distance, like hillocks, or very broken land: but in land there are very high mountains, called the High Land of Pullicat, though they are at a great distance from it, and not to be seen in hazy weather. The flag-staff at Pullicat is very high, and, when the flag is hoisted, it may be seen 4 leagues. When the high land of Pullicat bore W. by S. and the extremes of land from W. S. W. to W. N. W. off shore about 4 leagues, had 36 fathom; and, when the flag-staff of Pullicat bore W. S. W. $\frac{1}{2}$ W. about $3\frac{1}{2}$ or 4 leagues, had 30 fathom. The latitude of Pullicat 13 deg. 40 min. N. the longitude, computed from Pondicherry, 80 deg. 51 min. E. from London; the variation 42 min. W.

There is a dangerous shoal off Pullicat, with only 15 or 16 feet water on it; and the outside steep to. I once anchored, in the night, off this shoal, in 10 fathom, having shoalened it suddenly from 12 fathom; imagining therefore we were coming on the shoal, veered away $\frac{1}{2}$ a cable, the wind being easterly, and had but 8 fathom. In the morning, at day-light, sent the boat a sounding on this shoal, and found, a cable's length within where the ship lay, no more than 3 fathom: the distance from 12 to 3 fathom was not 2 cables length. A great ship should not come nearer this shoal than 13 or 14 fathom.

If

If you have a leading gale, you may clear the north part of this shoal by keeping the flag-staff of Pullicat W. by S. but, if the wind should be northerly, it will be necessary to allow it a larger birth, and steer in W. S. W. You may anchor in $5\frac{1}{2}$ or $4\frac{1}{2}$ fathom water, muddy ground, $1\frac{1}{2}$ or 2 miles off shore; the flag-staff bearing from W. by S. to W. S. W.



Of the Monsoons and Currents about the Island Zeloan.

THE new or full moon in the latter end of October generally brings about the change of the monsoon from the S. W. to the N. E. both on the Coast of Malabar and Coromandel; but this change of the monsoon has very different effects on the two different coasts; for on the Coast of Malabar the N. E. monsoon brings on the fair weather, &c. whereas, on the Coast of Coromandel, the N. E. monsoon brings on violent tempests and storms, with almost a constant heavy rain, thunder and lightening, or, during the intermissions thereof, dark, cloudy, hazey weather, and a great sea perpetually rolling in upon the shore.

And as the Island Zeloan, from its situation, is equally contiguous to both the above-mentioned coasts, so of consequence those parts opposite the Coast of Malabar, from Point de Gall, along by Columbo and the western coast of Zeloan, to the northward of Jafanapatam, partake of the fair and foul weather, as it happens on that coast; and those that partake of the weather as it happens on the Coast of Coromandel are from Dunder Head along the eastern coast of Zeloan to Point Pedro, or thereabouts: and along the southern coast of Zeloan, it may with truth be said, that the westerly winds prevail all the year round, in a greater or less degree; for in the height of the N. E. monsoon there are regular land and sea breezes (in the evening the wind comes off the land at E. or N. E. and about noon the sea-breeze sets in from the W. and S. W.) all the way between Point de Gall and Dunder Head: and there you meet the N. E. winds, blowing generally very strong, and which continue thus all along the eastern coast of Zeloan, with a continual strong south-westerly current, which sets off the land from Dunder Head towards the Maldivé Islands; whereby many ships have been driven from Zeloan to these islands, in little winds or calms, by not taking proper care to keep the Coast of Zeloan close on board; for, by keeping the coast on board from Dunder Head till you are past Gaula, you keep out of the current; and by keeping in soundings you may anchor upon occasion.

In the Gulph of Manara, which lies between Cape Comaroon and Zeloan, during the N. E. monsoon, the winds blow constantly in the N. E. quarter, and frequently very strong: off Point de Gall it decreases, and dies away. Most of our Directories make mention of the currents setting in and out of this gulph, at the different seasons of the year; and that a ship bound to the Malabar Coast, in the N. E. monsoon, in order to fall well in with Cape Comaroon, ought to coast it along Zeloan, as far as Calliture, before she crosses the gulph; and that a ship from Cape Comaroon, bound to Zeloan, should take care to fall in to the northward of Point de Gall, on account of the current setting out from the Gulph of Manara. As for my part, I never found much out-set in the N. E. monsoon, nor in-draught in the S. W. monsoon, the many times I have crossed this gulph; but always found the reckoning very exact, both from Cape Comaroon to Point de Gall, and

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from

50 *Sundry* REMARKS and OBSERVATIONS made in

from Point de Gall to Cape Comaroon: however, the caution is proper enough, as you cannot err in so doing.

Of making
a passage to
Bengal, or
Coromandel

Ships bound to Bengal, or the Coromandel Coast, in the N. E. monsoon, coast it along Zeloan, as far as Dunder Head (the strong N. E. winds and S. W. current preventing their coasting it further along this island): from this place, or hereabouts, therefore, they generally put off the coast, and stretch over to the eastward, and make Acheen Head, or the Niccabar Islands; from whence the Bengal ships generally keep along the east coast, all the way; but those bound to the Coast of Coromandel stretch over again, from thence or thereabouts, across the bay, for the coast, taking care to fall in to the northward of their port, on account of the current, which always runs strong to the southward, in the N. E. monsoon.

Uncertainty
thereof.

Sometimes ships, by doing as above mentioned, make very speedy passages, and sometimes the reverse. I have known many instances of both kinds, and shall mention one or two to shew the uncertainty of this passage. In December, 1760, Admiral Cornish sailed from Tillicherry, with a Squadron of his Majesty's ships, bound to Madras: they took their departure from the S. E. part of Zeloan, stood over to the eastward, and made, by their reckoning, between 13 and 14 degrees of easting, having been out of sight of land for 23 or 24 days, and expecting to make the Niccabar Islands, when, to their great surprize, they made the Island Zeloan again. In December, 1758, his Majesty's ship Queenborough sailed from Bombay for Madras, with 5 sail of Indiamen under her convoy: they took their departure from Dunder Head, or thereabouts, and stretched off to the eastward: the Shaftesbury, one of the Indiamen, being a very heavy sailer, the rest parted company with her, and left her to shift for herself: they continued standing to the eastward, and made a tolerable passage to Madras in 41 days; when, to their great surprize, they found the Shaftesbury at Madras, where she had arrived 10 or 12 days before them: the Shaftesbury coasted it all along Zeloan, and kept in shore all the way to Madras, and arrived about the beginning of February. I therefore look upon it, that all passages made from Zeloan to Bengal, or the Coast of Coromandel, in the N. E. monsoon, are entirely the effect of chance, and merely accidental, whether good or bad.

Southern
coast of Ze-
loan from
March to
October.

North-east-
ern coast in
April.

Northerly
current.

At the latter end of March, or the beginning of April, the westerly winds begin to set in strong at Point de Gall and thereabouts, and blow constantly till October, but do not reach so far as Trincomalay, or Point Pedro, till the latter end of April, or beginning of May: for in the month of April, about Batacalao, Trincomalay, and Point Pedro, and all that part of Zeloan, you have the winds variable and moderate; the sea-winds, in the day-time, from E. to S. E. and generally veer round to the southward towards evening; and early in the night the wind comes off the land from S. W. to W. Also, during this month, you have a very strong northerly current about this part of Zeloan, (from the Friar's Hood to Point Pedro) running in common $1\frac{1}{2}$ knot, and many times 2 knots, from N. N. W. to N. N. E. so that ships at sea, bound to Trincomalay, at this time of the year, should take care to fall in 10 or 12 leagues to the southward, on account of the current setting so strong to the northward; and the nearer the land, the stronger the current; but 20 or 22 leagues from the land you have none of this current, as I have found by experience.

Our Squadron found the bad effects of not keeping to the southward in April, 1762, in a passage from Madras to Trincomalay: when the Squadron fell in but little to the northward of Trincomalay, were in sight of the flag-staff point, yet were drove by the current half-way to Point Pedro, and some of the ships did not get in for 7 or 8 days after they made the land; whereas, if they had kept to the southward of Trincomalay, as above

above mentioned, they might have got in the same day they made the land. I advised keeping to the southward of Trincomalay, and to have made the land in about the latitude of 8 deg. but all my advice and remonstrances were rejected, and the consequence was (as before mentioned) we were 7 days longer at sea before we got into Trincomalay harbour.

In the beginning of May, about the 8th, 10th, or 12th, the westerly winds set in North-east- strong about Batacalao, Trincomalay, and Point Pedro; and blow so, without inter-
mission, all May, June, July, and August. When these westerly winds are set in, the current, that before set so strong to the northward, then ceases: and from Batacalao to Trincomalay, Point Pedro, and to Negapatam, I never found any current in these months, nor till the middle of September, when the winds begin to vary; and the current always goes with the wind.

From Batacalao to Trincomalay and Point Pedro, in August, the westerly wind sometimes ceases about noon, and is succeeded by a sea-breeze at east, or S. E. till towards evening, when the westerly wind comes strong off the land again. These kinds of winds will frequently happen in August, with some rain.

In the months of September and October, the winds and weather are much the same as on the Coast of Coromandel: and about the new or full moon, the latter end of October, the current runs as fast to the southward, as it did in April to the northward. I have been off Point Pedro, about that time of the year, in sight of the land, and in soundings, and have tried the current several times in the day, and found it set different ways, yet by the next day at noon have been set 48 or 50 miles to the southward, more than the run would give in the 24 hours: and in 48 hours have been set from Point Pedro to the Friar's Hood, having but little wind, and the weather being hazey with rain: when it cleared up, we were looking out for Trincomalay, and found ourselves a-breast the Friar's Hood; so that we were obliged to coast it back again to Trincomalay, close in shore: the current in those 48 hours had set the ship 94 miles more to the southward than the run would give; and it not only set to the southward, but the eastward withall; for, when we should have been, by our reckoning, several leagues in land, were 10 or 12 leagues off shore: so unaccountable are the currents at this time of the year. Therefore ships from the Coast of Coromandel, bound to Trincomalay, at this time of the year, should be sure to make the land about Point Pedro, and keep Zeloan close on board, to prevent being set past their port by the current, which runs 2 or 2 $\frac{1}{2}$ knots to the southward and south-eastward, at this time of the year. I would, by all means, advise them to keep in soundings; and in calms and light winds to anchor, if they find they deepen their water; for the current will set them out of soundings, as it did us in a calm; and when the wind came fair, we steered in for the land W.N.W. N.W. by W. and N.W. in order to keep to the northward of our port, and yet found ourselves as above mentioned.

At other times of the year I never found any current between Batacalao and Negapatam; for when the westerly winds set in strong, the current ceases hereabouts; I mean, within 5 or 6 leagues of the coast.



Of the Monsoons and Currents which prevail along the Coast of Coromandel.

The S.W. Monsoon.

June & July. **T**HE months of June and July differ but little one from the other, the S.W. monsoon being then in its height; and the land-winds blow constantly, for several days together, very strong at W. S. W. and W. When they are moderate, you commonly have a sea-breeze from S. S. E. or S. E. which brings about a very agreeable change of air, and very refreshing; for the westerly winds, during these 2 months, are sultry hot, and almost insupportable; and are very unhealthy, but more so some years than others. These land-winds sometimes blow with such violence, that they darken the air with the dust and sand they raise from the shore, and reach a good way off at sea: but this happens only in dry seasons; for when the squalls are more frequent, the rains prevent this effect of the winds, which is commonly about the end of June, and in July, rather than in August, when the squalls and rain are more frequent. When the westerly winds blow the hardest, I have remarked, there is frequently the greatest surf on the shore, particularly at Madras, where I have seen many of the bar-boats overset at these times. These months the current sets strong to the northward. In the offing the winds are constant from S. W. to W.

August. Early in the month of August the land-winds begin to be not so lasting; but you have more regular sea and land breezes from the S. E. veering towards evening to S. and so to S. W. nevertheless you have frequently hard squalls off the land, with much rain, and sometimes thunder and lightening. Towards the end of this month, these hard squalls, &c. frequently come from the W. N. W. and sometimes N. W. I have also known them to come on in the N. E. quarter, and blow very smart for an hour or two, with much rain; then varying round to E. S. E. and S. blowing strong all the while; then sometimes back round to the eastward again, in a hard squall with rain: when it veers round to the S. W. you have moderate and fair weather. The current continues strong to the northward all this month.

September. In the month of September the weather is uncertain, and the winds variable, with squalls and rain: but though the winds and weather are inconstant, the westerly winds prevail more than any other, often varying from S. W. to W. and so round to N. E. The day-breezes blow sometimes from N. E. but oftener between S. E. and S. S. E. In general, from whatever quarter the wind blows, it is very moderate, except a few squalls, which are violent when they blow from the land, but of short duration. The currents, which, all this monsoon, set with the wind strong to the N. and N. N. E. slacken in September, so that about the time of the equinox they make to the southward, and run strong by the end of the month.

October. October is the most inconstant month of the year on this coast; when the winds are exceeding changeable, frequent squalls, calms, rain, and fair weather. The N. E. monsoon is not perceivable till the middle, or towards the latter end, of this month; nor is it certain then. The currents, during this month, set strong to the southward.

Setting-in of the N. E. monsoon. At the setting-in of the N. E. from the S. W. monsoon, when the winds vary towards the S. E. they are pretty fresh, but when to the N. W. little winds and frequent calms. Sometimes

Sometimes in the forenoons it will blow fresh from the eastern board, and sometimes, for 2, 3, or 4 days, from N. N. W. very fresh, with hard squalls and rain; and in the afternoons, from N. E. or E. N. E. with thick rainy weather, and a prodigious great swell continually rolling in upon the shore, which makes the landing or coming off shore almost impracticable. This variety of squalls, rain, and dark, cloudy, hazey weather, that obscures the horizon, seems to threaten violent storms and tempests, which, however, seldom happen, but, when they do, generally prove fatal to those ships which remain upon the coast at such times; therefore all ships should depart this coast by the 10th, 15, or 20th of this month, at farthest.

A melancholy instance of this happened at Madrafs on the 21st and 22d of October, 1763. It was full moon the 21st. This day the storm came on in the same manner as at Pondicherry, (hereafter mentioned, p. 54. and 55.) with the wind at N. N. W. and N. his Majesty's ships Norfolk, America, and Weymouth, as also a great number of merchant-ships, being in the road. The men of war, foreseeing the storm coming on, prudently slipped, and went to sea before the wind came to the eastward: the merchant-ships, by not following their example while the wind was to the northward, but lying in the road till the wind came to the eastward, which put it out of their power to go to sea, many of them foundered at their anchors; others were driven a-shore, and were entirely lost; which loss was computed at 12 lack of rupees, besides the loss of many lives: but although the men of war got out, and had sea-room enough, yet they lost all their masts, and were in great distress; so that it was with great difficulty they could keep above water, the sea running very high, and so confused, that it run in heaps, and stove in their stern-windows, and washed every thing over-board out of their great cabin and ward-room. This great and confused sea was occasioned by the wind blowing so hard at north for several hours, and then flying about so suddenly to the eastward, where it blew hardest of all. This gale lasted almost 2 days. These storms are confined sometimes within very narrow bounds; they are very violent at some places, and hardly felt at others: the storm at Pondicherry, 1761, was but little felt at Madrafs, and much less at Tricaba and Negapatam: some of the men of war, coming from Trincomalay, were at sea in the offing of these two places, and felt little of it; but had a great and confused sea: nor was this storm felt so far to the southward as the last-mentioned places, although so violent at Madrafs.

The storms that happen in the N. E. monsoon very seldom reach so far to the southward as Trankabar or Negapatam; and the storms that happen in the petty monsoon, on the full or change of the moon in the latter end of April, or the beginning of May, seldom reach so far to the northward as Madrafs, but mostly happen on the south part of the coast. In this monsoon it is also very dangerous, as happened in 1749, when his Majesty's ships Namur and Pembroke were lost, with all their crews, off Porta Nova; as were several other ships; and all the squadron suffered very much.

The N. E. Monsoon.

How far soever the N. E. monsoon may be advanced in this month, yet you have, during November, the continuance thereof, variety of winds, though mostly from N. N. E. and N. E. They commonly blow in the morning from N. W. and N. N. W. and in the afternoon from N. N. E. to N. E. and sometimes from S. E. to S. W. for a day or two, though this does not frequently happen. The former part of this month is subject to calms for several days together, which are commonly followed by storms, with abundance of rain, which happen more at this than any other time of the year: they are often so violent, that no ship can possibly ride at anchor; generally beginning at N. W. and from thence

54 *Sundry* REMARKS and OBSERVATIONS made in

chopping successively to N. N. E. E. N. E. and E. when the sea rises so prodigiously as to foam a league off shore. If these tempestuous winds shift from east to south, they moderate, and the sky grows clear: but if, after having blown violently from the N. E. a calm ensues, presently it blows hard from S. E. S. or S. W. with rain and a great sea. Some years these hurricanes have not happened, or they have not blown so violent; so that ships might ride safe in the roads; but as this is so precarious, it is better not to abide on this coast. Strong southerly currents all this month. Out in the bay the winds blow from N. N. E. to E. N. E. with frequent storms and much rain.

December.

The monsoon is more regular in December, the winds being more constant, and less rain: on the coast they generally blow in the morning from N. W. and N. N. W. and at noon from N. N. E. to E. N. E. It commonly rains if the wind varies but from N. N. W. to N. as it does sometimes from N. E. when it blows very hard for 2 or 3 days together, which occasions a very great sea, so that no boats can pass, or repass, to or from shore: but notwithstanding this bad weather, whereby the ships in the road suffer, they may ride it out if they have good cables and anchors. Some years the winds are nearly alike, at the full and change, in December and January; and the same in the middle of February, when the January moon is late; but in general they are not so strong in January and February as in December. The currents still set strong to the southward. In the bay the winds are still between the N. N. E. and E. N. E.

January,
February,
and March.

During the months of January, February, and March, the weather is generally very fair, mild, and pleasant; the sky serene; the sea so extremely smooth, that often a ship's boat may land on the beach at Madras, where there is generally a greater surf than at any other part of the coast; and without storms, or, if they do happen, they are but of short duration: so that with truth it may be said, that these are the finest months in the year on this coast. The winds are mostly from E. N. E. and N. E. in the day, and varying to N. N. W. or N. W. in the night: or, more particularly, about the full and change of the moon, after midnight the winds blow from N. to N. W. a little fresh, sometimes to the S. W. and sometimes calm; but, when there is a brisk gale, it lasts uninterrupted till 9 or 10 in the morning, and from that time frequently calm; though sometimes it varies round to the W. and S. W. with light airs, till about noon; when, a little sooner or later, the sea-breeze sets in from the S. E. varying to E. N. E. and N. E. in the afternoon: but, whatever way the winds blow, the weather is always mild and moderate. In February the N. E. monsoon grows weak, the southerly winds opposing it, especially towards the latter end of the month; though some years these winds set in sooner on the coast than in others. Ships that sail at this time for Europe have often met these southerly winds, and been obstructed by the currents which set with the winds; but they are easily relieved by the first northerly or easterly winds, especially if they are far off shore, where the monsoon always lasts longer. The northerly winds continue some years till March, and even to the latter end thereof, but seldom without a revolution from the southward. In the offing and the bay the winds are mostly in the N. E. quarter, but sometimes vary from N. E. to S. E. and sometimes, but very seldom, to S. W. The current generally changes with the winds, mostly to the southward, and sometimes very strong. Notwithstanding January, February, and March, are the three finest months in the year, on the Coast of Coromandel, yet January is not free from storms, especially if the moon is near the full or change in the beginning of this month. A most melancholy instance of this happened on the 1st day of January, 1761, though the moon did not change till the 6th of this month. Pondicherry being at that time besieged by the English, and all our squadron lying before that place, the gale came on in the morning, blowing strong at N. N. W. which kept increasing till the evening, when it blew excessive hard, with a prodigious swell from the eastward: the sea looked quite white from the motion

it.

it was in, raising the mud from the bottom; the sky entirely overcast with a most wild and dismal appearance: some of the ships in the evening parted their cables, and went to sea; whereupon the admiral made the signal to cut or slip, and put to sea; and soon after that the wind flew about to the N. E. and blew a violent storm, with a deluge of rain: this continued some time, and then abated, or rather lulled; but at the same time the sky looked very terrible in the S. E. and the wind veering round that way, soon after came on a most violent hurricane of wind and rain, infinitely harder than it had been any time before, and continued so for several hours; then veered round to the southward, and moderated. Our Squadron suffered much in this storm: his Majesty's ships Sunderland, Duke of Aquitain, and the Duke store-ship, foundered, and their crews perished; the Newcastle, Queenborough, and Protector fire-ship, were driven on shore, but their crews saved; and most of the squadron lost their masts, and suffered much in other respects.

April is a very precarious month, the weather being very uncertain, and the winds April. variable, with some rain. In the beginning of this month the monsoon dies away, and you have the winds from the sea at E. S. E. or S. E. sometimes fresh gales, varying towards the evening, round to S. and S. W. frequently little wind, but seldom calm in shore, or coastways, except before some gale of wind, or the return of the N. E. monsoon, Petty monsoon which sometimes happens. This return of the N. E. monsoon makes the April moon dangerous on the Coromandel Coast; but it does not always bring storms, though the weather looks very threatening: yet you may have fresh gales, with squalls and much rain, that hold for 2 or 3 days, with a great swell from the eastward: therefore you had better, in this time, take a proper birth from the shore, in 16 or 18 fathom water. I have seen the sea at these times ready to break in 8 fathom, so that the swell alone was sufficient to make a ship part her cables. The English squadron was so circumstanced, in 1760, off Cuddalore, riding in 7 or 8 fathom water: had the gale set in as it threatened, it must have proved fatal to them. This is called the petty monsoon: however, in the April full moon there have been sometimes violent storms and hurricanes, by which many ships and lives have been lost, and great damage done. In some years, about the end of April, the westerly winds blow for 2 or 3 days together. Out in the bay there are little winds, variable with calms: the wind mostly from N. E. E. and S. E. yet sometimes it blows a fine fresh gale at N. E. for 2 or 3 days together.

In the month of May the winds blow mostly from S. E. and S. S. E. from which May. quarter they blow the strongest, and continue for several days together without intermission. When these winds are moderate, they commonly begin about 9 or 10 o'clock in the morning, and continue so till 9 or 10 at night, and sometimes all night; and then shift to S. S. W. and S. W. till about the usual time of 9 or 10 o'clock in the morning, when they shift again, freshen, and blow strong from S. S. E. and S. E. Some years, in this month, you have squalls of wind from the N. W. that last an hour or two, with rain and thunder. The sky is generally clear, except sometimes in the evening it is cloudy in the western board, accompanied with lightening; also, when it blows fresh in the day-time, the weather is hazey, and the horizon somewhat obscured. Between the sea and land breeze it is sometimes calm, though very seldom: the breeze is strongest when there is no calm; and the S. W. wind shifts to S. S. S. E. and S. E. During this month the currents run very strong to the N. and N. N. E. all along the Coast of Coromandel.



Remarks on a Passage from Madrafs to the Island Diego Rayes, in the South-West Monsoon; with a Description of the said Island, and Directions for sailing in and out of the Road or Harbour thereof; the Soundings, Marks for particular Rocks, Shoals, &c. and our Return from thence to Madrafs in the North-East Monsoon.

Sail from
Madrafs,

Put off the
coast.

By norther-
ly currents
obliged to
stand on
again.

Put off from
Negapatam.

Make the
flag-staff P.

THE Elizabeth sailed from Madrafs, in company with his Majesty's Squadron under the command of Commodore Tiddeman, on the 4th of August, 1761. We continued working along shore to the southward, taking all advantages of the sea and land winds, and found little or no current, either for or against us. On the 10th, being off Trankabar, the commodore was persuaded to put off the coast; accordingly did so, and on the 11th found we had a strong northerly current against us, as by observation we were 25 miles to the northward of account, and the next day 28; tried the current, and found it set 1 knot 2 fathom, N. by E. had the winds from S. E. to S. W. - These strong northerly currents obliged us to stand in again for the coast, and determined us to abide by our first plan of operation, which was, to keep along the coast as far as Negapatam, and from thence stretch over for Zeloan, to water at Trincomalay; then coast it along that island as far as the Friar's Hood, and from thence take our departure for Diego Rayes. The 13th and 14th, the current set us each day 22 miles to the northward. On the 14th, at 10, P. M. saw the land, being Calderoon Wood, bearing west. From thence we worked along shore, and anchored occasionally, having the current only from 3 to 5 fathom to the northward. The 15th, at noon, were off Negapatam, and took our departure from it, for Trincomalay. From the day we left Trankabar and stood off the coast, to the time we fell in with Calderoon Wood, was 4 days; and from the time we made Calderoon Wood, to the time we anchored in the Back Bay, was 4 days: which shews, that, if we had kept in shore, we should have been at Trincomalay at the time we fell in with Calderoon; which was 4 days lost. On the 16th, found no current; and on the 17th, at noon, the flag-staff point at Trincomalay bore W. S. W. about 5 leagues: here we had strong W. S. W. winds, and were set 24 miles to the southward of account. The 18th, at midnight, anchored in Back Bay, Trincomalay. The 20th, having completed our watering, at midnight weighed from thence, with strong W. S. W. winds. We coasted it along Zeloan by help of the sea and land breezes from S. E. to S. W. and W. and found little or no current; and on the 22d, in the evening, took our departure from the Friar's Hood, whose latitude, longitude, and the variation off it, you have in p. 40.

In our passage from Zeloan to the Line we had fresh steady gales from W. S. W. to S. W. from the Line to $3\frac{1}{2}$ deg. S. had little winds, variable, and intermixed with calms; from thence had the winds in the S. E. quarter, generally from E. S. E. to E. soon increasing to fresh gales, which continued all the way to Diego Rayes, off which island we arrived the 15th of September.

A Description

A Description of the Island Diego Rayes, &c.

Diego Rayes is an island situated in lat. 19 deg. 44 min. S. and long. 61 deg. 30 min. E. Lat. &c. from London, according to the Mariner's Compass Rectified: the longitude we made, from the east coast of Zeloan, in the parallel of the Friar's Hood, home to Diego Rayes, was 21 deg. 40 min. W. so that, allowing that part of Zeloan in 82 deg. 8 min. E. from London, it will make Diego Rayes to lie only in 60 deg. 28 min. E. from London. The variation, about 10 or 12 leagues to the eastward of this island, 9 deg. 15 min. about 3 miles off the east end of it, 15 deg. 52 min. in the road, or harbour, 9 deg. 41 min. and 8 or 9 leagues to the westward of the island, 12 deg. 10 min. westerly. This island is very high ^{Appear-} and mountainous, and from all appearances looks as if it had been shaped by an earthquake, ^{ance, &c.} there being scarce 50 yards of level land upon the whole island; and is every where covered with trees, shrubs, &c. It is about 15 or 16 miles long, and 6 broad, environed with reefs of rocks and shoals, in some places 3, 4, 5, or 6 miles, more or less, from the shore, except the N. E. part of the island, which is bold to, having, within $\frac{1}{2}$ a mile of the shore, 16, 18, and 20 fathom: and from this depth, as you stand to the northward, you will have 25, 30, 40, and 45 fathom, 3 miles off shore; and without that, no soundings: further to the westward the soundings are more gradual. On the middle of the island there is a remarkable high peak, which is a good mark for the road or harbour: when the ^{Mark for} said peak bears south, you are then a-breast of the road: when it bears from S. by W. ^{the road.} to S. S. E. you may stand in shore to 16 or 18 fathom, gradual soundings: but the bottom in general is coral rocks, though you may find some few spots sand and mud; nevertheless there is no such thing as anchoring with safety without the road. You may stand off shore with the above bearings, the water deepening pretty gradually to 30, 40, and 45 fathom, in some places, more or less, and then no soundings, 3 or 4 miles off shore.

During the 7 weeks we cruized off this island, I have observed, for several days together, ^{Currents.} the current ran so strong to the westward, that it was with great difficulty we could keep our station, with a constant press of sail on the ship, &c. and notwithstanding all our utmost endeavours, often found that we have lost ground for several days together. At other times I have observed the current run as strong to the eastward, so that, when it has blown such a gale of wind, as to put us under close reefed top-sails, we have yet got ground, or at least held our own for several days together: and in moderate weather, while lying-to for 8, 10, or 12 hours together, the current has kept us up so that we have held our own. I also observed, the current ran strongest at the full and change of the moon.

The winds blow constantly between the E. and S. E. sometimes very strong gales, ^{Winds} with showers of rain; and most frequently fresh gales, with fair, cloudy, or hazy ^{and weather} weather, as it happens; and sometimes the weather is moderate, fair, and clear, and the sea extremely smooth for several days together: it is sometimes calm, but very seldom.

There is a good road or harbour on the north side of this island, right under the peak, ^{The road,} where there is a small level spot of land between 2 hills, with a level sandy beach, ^{that or harbour.} that extends along shore for about $\frac{1}{2}$ a mile, and seems to form a small kind of bay, in the middle of which stand 2 or 3 small wooden houses: one, larger than the rest, was the habitation of the French governor, as we called him, who was a lieutenant in the French East-India company's service, and had his family here, a surgeon, and several slaves, in order to get a quantity of sea and land turtle in readiness to send to Mauritius when the vessels arrived from thence, which are constantly employed on that service. This road or harbour is very safe when you are in; where you may anchor in 12, 13, or 14 fathom, sand and mud, clear, and good holding ground, about $\frac{1}{2}$ a mile from a reef, in shore from you, and which is about $\frac{1}{4}$ of a mile from the shore, which is very shallow, whereby the
X landing



Remarks on a Passage from Madrafs to the Island Diego Rayes, in the South-West Monsoon; with a Description of the said Island, and Directions for sailing in and out of the Road or Harbour thereof; the Soundings, Marks for particular Rocks, Shoals, &c. and our Return from thence to Madrafs in the North-East Monsoon.

Sail from
Madrafs.

Put off the
coast.

By norther-
ly currents
obliged to
stand on
again.

Put off from
Negapatam.

Make the
flag-staff P.

THE Elizabeth sailed from Madrafs, in company with his Majesty's Squadron under the command of Commodore Tiddeman, on the 4th of August, 1761. We continued working along shore to the southward, taking all advantages of the sea and land winds, and found little or no current, either for or against us. On the 10th, being off Trankabar, the commodore was persuaded to put off the coast; accordingly did so, and on the 11th found we had a strong northerly current against us, as by observation we were 25 miles to the northward of account, and the next day 28; tried the current, and found it set 1 knot 2 fathom, N. by E. had the winds from S. E. to S. W. - These strong northerly currents obliged us to stand in again for the coast, and determined us to abide by our first plan of operation, which was, to keep along the coast as far as Negapatam, and from thence stretch over for Zeloan, to water at Trincomalay; then coast it along that island as far as the Friar's Hood, and from thence take our departure for Diego Rayes. The 13th and 14th, the current set us each day 22 miles to the northward. On the 14th, at 10, P. M. saw the land, being Calderoon Wood, bearing west. From thence we worked along shore, and anchored occasionally, having the current only from 3 to 5 fathom to the northward. The 15th, at noon, were off Negapatam, and took our departure from it, for Trincomalay. From the day we left Trankabar and stood off the coast, to the time we fell in with Calderoon Wood, was 4 days; and from the time we made Calderoon Wood, to the time we anchored in the Back Bay, was 4 days: which shews, that, if we had kept in shore, we should have been at Trincomalay at the time we fell in with Calderoon; which was 4 days lost. On the 16th, found no current; and on the 17th, at noon, the flag-staff point at Trincomalay bore W. S. W. about 5 leagues: here we had strong W. S. W. winds, and were set 24 miles to the southward of account. The 18th, at midnight, anchored in Back Bay, Trincomalay. The 20th, having completed our watering, at midnight weighed from thence, with strong W. S. W. winds. We coasted it along Zeloan by help of the sea and land breezes from S. E. to S. W. and W. and found little or no current; and on the 22d, in the evening, took our departure from the Friar's Hood, whose latitude, longitude, and the variation off it, you have in p. 40.

In our passage from Zeloan to the Line we had fresh steady gales from W. S. W. to S. W. from the Line to $3\frac{1}{2}$ deg. S. had little winds, variable, and intermixed with calms; from thence had the winds in the S. E. quarter, generally from E. S. E. to E. soon increasing to fresh gales, which continued all the way to Diego Rayes, off which island we arrived the 15th of September.

A Description of the Island Diego Rayes, &c.

Diego Rayes is an island situated in lat. 19 deg. 44 min. S. and long. 61 deg. 30 min. E. Lat. &c. from London, according to the Mariner's Compass Rectified: the longitude we made, from the east coast of Zeloan, in the parallel of the Friar's Hood, home to Diego Rayes, was 21 deg. 40 min. W. so that, allowing that part of Zeloan in 82 deg. 8 min. E. from London, it will make Diego Rayes to lie only in 60 deg. 28 min. E. from London. The variation, about 10 or 12 leagues to the eastward of this island, 9 deg. 15 min. about 3 miles off the east end of it, 15 deg. 52 min. in the road, or harbour, 9 deg. 41 min. and 8 or 9 leagues to the westward of the island, 12 deg. 10 min. westerly. This island is very high ^{Appearance, &c.} and mountainous, and from all appearances looks as if it had been shaped by an earthquake, there being scarce 50 yards of level land upon the whole island; and is every where covered with trees, shrubs, &c. It is about 15 or 16 miles long, and 6 broad, environed with reefs of rocks and shoals, in some places 3, 4, 5, or 6 miles, more or less, from the shore, except the N. E. part of the island, which is bold to, having, within $\frac{1}{2}$ a mile of the shore, 16, 18, and 20 fathom: and from this depth, as you stand to the northward, you will have 25, 30, 40, and 45 fathom, 3 miles off shore; and without that, no soundings: further to the westward the soundings are more gradual. On the middle of the island there is a remarkable high peak, which is a good mark for the road or harbour: when the ^{Mark for} said peak bears south, you are then a-breadth of the road: when it bears from S. by W. ^{the road.} to S. S. E. you may stand in shore to 16 or 18 fathom, gradual soundings: but the bottom in general is coral rocks, though you may find some few spots sand and mud; nevertheless there is no such thing as anchoring with safety without the road. You may stand off shore with the above bearings, the water deepening pretty gradually to 30, 40, and 45 fathom, in some places, more or less, and then no soundings, 3 or 4 miles off shore.

During the 7 weeks we cruized off this island, I have observed, for several days together, ^{Currents,} the current ran so strong to the westward, that it was with great difficulty we could keep our station, with a constant press of sail on the ship, &c. and notwithstanding all our utmost endeavours, often found that we have lost ground for several days together. At other times I have observed the current run as strong to the eastward, so that, when it has blown such a gale of wind, as to put us under close reefed top-sails, we have yet got ground, or at least held our own for several days together: and in moderate weather, while lying-to for 8, 10, or 12 hours together, the current has kept us up so that we have held our own. I also observed, the current ran strongest at the full and change of the moon.

The winds blow constantly between the E. and S. E. sometimes very strong gales, ^{Winds} with showers of rain; and most frequently fresh gales, with fair, cloudy, or hazy and weather weather, as it happens; and sometimes the weather is moderate, fair, and clear, and the sea extremely smooth for several days together: it is sometimes calm, but very seldom.

There is a good road or harbour on the north side of this island, right under the peak, ^{The road,} where there is a small level spot of land between 2 hills, with a level sandy beach, that ^{or harbour.} extends along shore for about $\frac{1}{2}$ a mile, and seems to form a small kind of bay, in the middle of which stand 2 or 3 small wooden houses: one, larger than the rest, was the habitation of the French governor, as we called him, who was a lieutenant in the French East-India company's service, and had his family here, a surgeon, and several slaves, in order to get a quantity of sea and land turtle in readiness to send to Mauritius when the vessels arrived from thence, which are constantly employed on that service. This road or harbour is very safe when you are in; where you may anchor in 12, 13, or 14 fathom, sand and mud, clear, and good holding ground, about $\frac{1}{2}$ a mile from a reef, in shore from you, and which is about $\frac{1}{4}$ of a mile from the shore, which is very shallow, whereby the landing

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East Chan-
nel very dif-
ficult and
dangerous.

landing at low water is very bad. Our whole squadron went in and anchored in this road, through the eastern channel, though it is very difficult of access; and therefore I can give no proper directions for sailing into this road, through it. We were obliged, after a great deal of trouble in sounding to find out this channel, to buoy and beacon it off in a very particular manner; the soundings being very irregular, one cast 10 or 12, the next 5, 4, 3, or $2\frac{1}{2}$ fathom; the bottom all sharp coral rocks, like pyramids. I have been with a boat on the top of one of these pyramids in a calm, when, the water being very clear, I could see it very plain, and had $3\frac{1}{4}$ fathom at the boat's bow, and 13 or 14 fathom at the stern: the top of this rock was not bigger than a ship's mizen-top. Notwithstanding the intricacy of this channel into the road, some ships have blundered into and out of this place, though some of them have struck pretty hard upon these rocks, and yet escaped, without being lost, which was better luck than they deserved. Indeed a small ship, that draws no more than 12 or 13 feet water, may run into this road over all, by keeping the peak S. by W. $\frac{1}{4}$ W. or S. by W. $\frac{1}{2}$ W. and the governor's house, if standing, S. S. W. $\frac{1}{2}$ W. or S. S. W. $\frac{3}{4}$ W. With these marks such a ship may run in clear of all danger, but will have very irregular soundings.

New, or
Western
Channel.

Whilst the squadron lay at Diego Rayes, great pains was taken to sound and survey the harbour, whereby we discovered a very fine, open, and clear passage to the westward, which we called the Leeward or Western Channel, never before known; for ships used to go out the way they came in, which was both more difficult and dangerous than going in; for they ran out thwart the dangerous shoal of rocks called the Middle Ground, several places thereof being so shoal, that the sea breaks on it in a fresh gale of wind: on some places you have 3 fathom; on others $2\frac{1}{2}$, 2, and $1\frac{1}{2}$ fathom: these are all different shoals, with 6, 7, or 8 fathom water between them. I should look upon it next to a miracle for a great ship to go out clear of them all, as they always go out with a scant wind; although some ships have been lucky enough to do so. The marks to go out of the road or harbour, through the Leeward or Western Channel, are, to run so far to the westward as to bring the peak about a sail's breadth to the eastward of the governor's house: keep the peak so, or a little more open to the eastward of the governor's house; and that will lead you out in a safe and clear channel. Your course out will be about N. by W. and the peak will bear about S. $\frac{3}{4}$ E. You will have 17, 18, 16, 13, 12, and no less than 11 fathom: and when the east point of the island is open with the east point of the bay, you are in 18 fathom, and clear of all the shoal, and may steer away as you please. There are gradual soundings off the N. W. part of the reef; and off Booby Island it shoalens gradually from 30 fathom, 2 or 3 miles off, to 7 or 8 fathom within a cable's length of the reef.

The marks
to go out.

Anchorage.

You may anchor in the harbour in 11, 12, or 13 fathom, the peak bearing S. $\frac{1}{4}$ W. or S. $\frac{1}{2}$ W. the east point of the bay, which is the easternmost land in sight, E. by S. $\frac{3}{4}$ S. Booby Island W. $\frac{3}{4}$ N. and Diamond Island W. S. W. $\frac{1}{2}$ S. when it is in one with 2 little hillocks near the west part of the island. For a better explanation of this road or harbour, I refer you to my Draught of the north side of this island, shewing its dangerous reef, the middle ground, and other dangers.

Stormy sea-
son.

This island is subject to storms and hurricanes, and has the same seasons as they have at Mauritius and Maschareen, or, as the French now name them, the islands of France and Bourbon. Their stormy months are January, February, and March, when the hurricanes are sometimes very violent.

Tides, &c.

In the Harbour of Diego Rayes there is a regular tide, the flood to the eastward, and the ebb to the westward, at the rate of 2 knots an hour. It flows N. by E. or $\frac{3}{4}$ of an hour, being high water at $\frac{3}{4}$ past 12 o'clock, on the full and change of the moon; when also it rises perpendicular about 6 feet.

Plenty

Plenty of water may be got here: near the governor's house there is a running stream Wood and good water; and there are several other good watering-places in this bay, and all water. There is also plenty of fire-wood for cutting. In October and November, 1761, all our Squadron wooded and watered here with great ease.

Here is abundance of fish of several sorts. Those caught with hook and line in deep water are reckoned unwholesome and of a poisonous nature, by the French governor's account, and as we afterwards found by experience; whereas those got in a seine or net, in shore, are exceeding good and wholesome, and in great plenty. Here are also great plenty of sea and land turtle, particularly the latter, that we victualled our sick people entirely upon, and also served the ships companies several days in the week with them. Here are likewise abundance of manatees, which are good and wholesome food: but herbs and vegetables are very scarce, there being no part of the island cultivated, but a small garden of the governor's.

The soil is rich and fertile, and would produce any thing sown or planted in it. Many The soil and things grow here spontaneously, such as limes, oranges, figs, long-pepper, and several air. other things; but none of them were in season when we were there. The air of this island is healthy, and of a fine temperature: our sick people that were sent on shore here recovered very fast, particularly those who had the scurvy.

Return from Diego Rayes to Madrafs.

On the 1st of December, 1761, we sailed for India, with all the Squadron in company. From the Island Diego Rayes to the lat. 27 deg. S. we made longitude from thence 7 deg. 36 min. E. found the variation 12 deg. 34 min. W. and had the wind from E. S. E. to N. E. but mostly in the N. E. quarter; and sometimes to the westward of north, in the above latitude, found the winds variable, with squalls and rain: this kind of weather continued to lat. 23 deg. 20 min. S. the winds variable, but mostly between N. W. and S. W. the longitude made, to the last mentioned lat. 11 deg. 8 min. E. from Diego Rayes, and there found the variation 7 deg. 41 min. W. then had the S. E. trade from E. to S. E. by S. which continued to lat. 10 deg. 4 min. S. and longitude, made from Diego Rayes, 18 deg. 39 min. E. where the variation was 26 min. W. From thence to 1 deg. N. longitude, made from Diego Rayes, 28 deg. E. the variation 54 min. E. had fresh gales and cloudy, squally weather with much rain; the winds veering from E. to S. E. S. S. S. W. and W. S. W. and from that to W. N. W. and N. W. and back to S. W. again. From 1 deg. N. to 3 deg. 42 min. N. about the same meridian, and the variation 48 min. E. had little winds, variable; though mostly from S. W. to N. W. and N. and sometimes calm. Then had the N. E. monsoon, or steady moderate gales, from N. N. E. to E. N. E. which continued all the way to Pullicat and Madrafs, with fine, clear, pleasant weather, and smooth water; where we arrived the 26th of January, 1762, and made 18 deg. 5 min. E. long. home to Pullicat.



Remarks on a Passage from Madrafs to Trincomalay, on the Island Ceylon, in April, 1762, in order to shun the Petty Monsoon.

WE sailed from Madrafs the 9th of April, and had mostly little winds and fair Winds and weather, with smooth water; the winds chiefly from E. S. E. to S. S. S. W. weather. and sometimes S. W. sometimes we had the winds in the N. E. quarter, and then the breezes were fresher and steadier than in any other.

We

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Currents. We had various kinds of currents, setting sometimes strong to the northward, at others as strong to the southward, and for several days together were sensible of no current at all. Though the currents are thus variable out in the bay, where they change with every shift of wind of any strength or continuance, yet thus much may be depended on for certain, that the nearer the coast, the stronger the current; as for instance, the 1st day we left Madras, the current set the ship 62 miles to the northward; the next day only 8 miles; and the 3d we found no current at all: so also, the day before we made Ceylon, the ship's run and the observation agreed exactly; we made Ceylon at 6 A. M. and at noon found the ship 35 miles to the northward of our reckoning; and when we got in shore, and anchored, we found the current sometimes run at the rate of 2 knots: all which together sufficiently proves that the nearer the land, the stronger the current. Notwithstanding the different currents we met with on our passage from Madras to Ceylon, yet we found our reckoning pretty just at our making the land.

Variation. All along the Coast of Coromandel the variation, what little there is, is westerly; and this west variation continues for $1\frac{1}{2}$ or 2 deg. of longitude from the coast; and then it changes to east variation: and you may depend upon it, if, coming in with the Coromandel Coast, you change your variation from east to west, you are not more than 30 or 40 leagues from the coast.

A caution, not to fall in to the northward. It is well known, that in April, and to the middle of May, the winds about the N. E. part of Ceylon are mostly from S. E. to S. in the day-time, and south-westerly in the night, as mentioned in the account of winds and currents about the Island Ceylon, p. 50. These southerly winds occasion a very strong northerly current at this time of the year; therefore I would recommend it to all ships, bound to Trincomalay at this season, to make the land in the latitude of 8 deg. N. which is $\frac{1}{2}$ a degree to the southward of Trincomalay, and thereby save much time and trouble, as we experienced by falling in to the northward, (though against reason, experience, and my remonstrances) where we met with southerly winds and northerly currents, and were forced to work up in shore, anchoring, &c. whereby we lost 7 days, not getting into Trincomalay till the 8th of May; whereas we might as well have gotten in the same day we made the land, which was the 1st of May. Let this serve as a caution to those that come this way hereafter: and remember, that it is better to fall in 20 leagues to the southward, than 2 leagues to the northward.

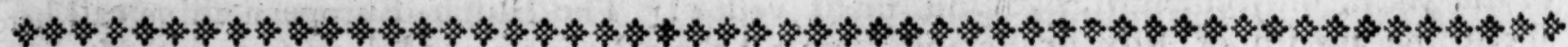
We lay in Trincomalay Harbour from the 8th of May to the 5th of July, in which time I finished my survey of Trincomalay Bay and Harbour.

Winds and weather whilst at Trincomalay. From the 8th to the 14th of May, had regular land and sea-breezes, with hot sultry weather; the sea-breeze at S. E. and the land-winds from S. W. to W. by S. From the 14th had no more sea-breezes; but the land-winds blew constantly from S. W. by W. to S. W. by S. fresh gales, and clear weather: they were sometimes moderate, but very seldom, and then of short continuance. These land-winds blow so strong sometimes, that they may very justly be called gales of wind, particularly in the opening of the great bay, where they sometimes blow excessive hard.

From Trincomalay to Madras. For a more particular Description of the Bay and Harbour of Trincomalay, with Directions for sailing in and out, and the Marks for avoiding the Dangers, &c. I shall refer you to the succeeding chapter, in p. 61.

Hard squalls. We sailed from Trincomalay the 5th of July for Madras; and as I have already given a Description of the Coast between Trincomalay and Madras, with particular Instructions for crossing from Ceylon to the Coast of Coromandel, in the S. W. Monsoon, in p. 43. &c. I shall say nothing of it here, and only further observe, that in the evening of the 8th of July, being off Calderoon Wood, we were taken a-back with a very hard squall of wind and rain, with much thunder and lightening, from the N. E. quarter;

quarter, which obliged us to lie-to under fore-sail and mizen; then had strong gales, and variable all round the compass, with much rain, thunder and lightening, so as several times to be taken a-back: this weather continued till midnight, when it moderated; but had then fresh gales from S. S. W. with a constant heavy rain, till 4 A. M. Next day anchored in Madrafs Road.



The Method of making a Passage from Trincomalay to Madrafs, or any other Part of the Coast of Coromandel, in the N. E. Monsoon.

OUR squadron, when at Trincomalay in the N. E. monsoon, and bound to the Coast of Coromandel, always stretched off from Trincomalay to the eastward, a small distance, more or less, as the wind hung to the northward or eastward; always taking the advantage of the wind's veering to the eastward to stand to the northward, and when the wind veered to the northward to stand to the eastward. In the offing the winds hang pretty much to the eastward; so that, if a degree or two of easting from Trincomalay, you will be able to fetch any part of the coast you may be bound to. Several of our ships have made a passage from Trincomalay to Pondicherry in 9 or 10 days, and to Madrafs in 12 or 13 days, even in December, which is the height of the N. E. monsoon; taking care to fall in to the northward of their port in this monsoon.



A Description of the great Bay of Trincomalay, the Harbour of Back-Bay, &c. with the Set of the Tides, Soundings, Marks for particular Rocks, Shoals, &c. as also the Latitude, Longitude, and Variation of the Compass.

HAVING never met with a description of Trincomalay in any of our sea books or charts, nor seen any good draughts of the harbour or bay, I shall therefore be as particular in my description of it as possibly I can.

Trincomalay is, perhaps, one of the finest harbours in the known world, being very Commodious large and safe, as it is entirely surrounded by the land; so that you lie there secured in your harbour from all winds that can blow; the bottom clear, and good holding ground; and is spacious enough to contain 1000 sail of ships: there are many good and convenient coves for careening ships, &c.

There are several watering-places which are particularly distinguished in my Draught of Wooding & this Bay. The ships that water in Back-Bay usually fill it in the fort; and those who do watering not, must fill it at the well in the town, where they will have $\frac{1}{4}$ of a mile to roll their casks. The watering-places are commanded by the forts in Back-Bay; and those in the harbour by the forts at the mouth of the harbour. As for wood, it is to be had every where in plenty.

Fresh provisions for present use, and refreshments, may be got here; but in small Provisions, quantities, not more than sufficient to supply two men of war. The only species of fresh provisions

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provisions to be had here are beef, buffalo, hogs, and a few fowls; little or no vegetables; and what you do get is very dear. As for sea-provisions, there are none of any kind to be had.

Trade.

Although the situation of this port, and its commodiousness, make it a convenient place for trade, yet is there little or none carried on here. There are no ships belonging to the place, only country boats and small vessels. The Dutch European ships call here about the month of July or August, transact their business, and depart again before the N. E. monsoon sets in. They generally lie in Back-Bay.

Lat. &c.

The latitude of Flag-staff Point, by several observations, is 8 deg. 32 min. N. the longitude, by astronomical observation, is 81 deg. 40 min. E. from London; and the variation 45 min. easterly. It flows here, on the full and change, east and west, or 6 hours; and it flows perpendicular 3 feet: the tide has little motion but on the south side the bay, where it runs, at spring-tides, the ebb $1\frac{1}{2}$ knot to the eastward, and the flood a knot to the westward; the flood 4 hours, and the ebb 8 hours.

Whereby to know Trincomalay.

The land about Trincomalay is very remarkable, being high land all round the harbour, and no other high land near it, either to the northward or southward. To the southward of the high land about the harbour is the great Bay of Trincomalay, which is 6 or 7 miles north and south, and 7 or 8 miles east and west. This bay is very deep as well as large, having no soundings but on the southern shore, which is all low land, and on which there are 4 rivers; but none of them navigable for any thing but small boats.

Flagstaff P.

The Flag-staff Point is still more remarkable, which is very high, steep, and covered with trees. It is narrow, and stretches out into the sea about $\frac{1}{4}$ of a mile, where it terminates in a point, which breaks off suddenly from its full height, right perpendicular down to the sea, with a rock about the height of a ship's hull, in the sea, close to the point. On the top of this point the Dutch have a look-out house, whereon they hoist their flag when any ships are in sight in the offing; by which Trincomalay may be known a great way at sea: the high steep point, and the Dutch flag on it, make it very conspicuous. This point makes the same, coming either from the northward or the southward. There is also, on the middle of the flag-staff point of land, a very large remarkable tree, which, when in one with Chapel Point, is a mark for clearing the shoal S. W. of Norway Island.

Back Bay.

To the northward of Flag-staff Point, between it and Elizabeth's Point, there is a spacious and safe bay, called Back Bay, being a fine, large, round bay, with a smooth sandy beach, and good landing any where. In the S. W. monsoon, it is very safe and smooth lying in this bay, which has a clear sandy bottom, with gradual soundings towards the shore. You may anchor any where in this bay from 7 to 12 or 15 fathom, from $\frac{3}{4}$ of a mile to $\frac{1}{2}$ mile off shore; the Flag-staff Point bearing from S. E. by S. to S. by E. Here is plenty of water and wood. Ships that water in this bay fill it in the fort, where there are several wells with abundance of water. The proper landing-place is at the fort, where the Dutch have built a wooden pier for the conveniency of landing.

Directions for a Ship, coming from the Southward, bound into Trincomalay Harbour.

To clear the reef off Foul Point.

The first danger to be guarded against, going into Trincomalay Bay, from the southward, is Foul Point, which I have already described in p. 42. and may be avoided by keeping in 14, 15, or 16 fathom; and when Round Island is a sail's breadth open to the southward of Marble Point, you are clear of that danger: Marble Point will then bear W. by S. $\frac{1}{4}$ S.

With

With the above marks you may run up the bay till you open the harbour's mouth: To steer up but you have no soundings, as you run up the bay, after you are to the westward of Nor-^{the bay.} way Island.

The course into the harbour is N. W. by N. keeping mid-way between Round Island ^{To enter the} and Elephant Island, where you still have no soundings. ^{harbour.}

Come not near the west point of Elephant Island; for, about a cable's length N. W. by ^{Elephant} W. therefrom, lie dangerous rocks, with only 6 feet water on them; to go clear of ^{Shoal.} which, keep the White House, that stands on the top of Osnabrug Point, 2 fails breadth open with Elephant Fort Point. The harbour's mouth is very narrow, being not more than 2 cables length over, and 30 fathom water in the middle; each point steep to, so that you may go within a ship's length of either; therefore you may run boldly in, there being no danger but what may be seen.

After you have got through the narrow entrance, you will come into a fine spacious ^{York Shoal.} harbour, where ships lie sheltered from all winds that blow; the bottom clear, and good holding ground: but right in the middle of the harbour lies a dangerous shoal of rocks, on which there is not above 5 feet water, called York Shoal, which you will avoid by keeping Round Island a fail's breadth open with Osnabrug Point, till you bring the flag-staff on Flag-staff Point, upon the gap of the wood, at the town; when you are clear of it, and may run up towards the town, and anchor where you please, or in what depth you please from 17 to 8 fathom. Here are many convenient coves and places for ships to lie in, or careen, heave down, &c. as may be seen more particularly in my Draught of this place.

Directions, coming from the Northward, and bound into Trincomalay Harbour.

You may pass by Pigeon Island within a mile, a mile and a half, or 2 miles of it, in ^{Pigeon I.} 21, 22, or 24 fathom. What is called Pigeon Island is a cluster of rocks, both above and under water, the outermost of which is the largest and highest, and has several green trees and shrubs on it: between it and the main there is no passage, being all foul ground, with rocks above and under water. I have taken great pains in sounding about the outer part of this island; and had 22 fathom a mile and a half without it; sounded towards the island, and had 21, 21, 20, 19, 17, 16, soft ground, within half a mile of it. This island bears from the Flag-staff Point, at Trincomalay, N. by W. $\frac{3}{4}$ W. 12 or 13 miles. Off Pigeon Island, when you have 36 or 38 fathom, you are just at the edge of the bank, and the next cast may be 40 or 42 fathom, or, perhaps, no ground. If it should prove calm, or the current against you, take care to anchor, rather than be set off the bank.

From Pigeon Island you may coast it along as far as Elizabeth's Point in 20 or 18 ^{Rocks off} fathom, though the soundings are a little irregular between them. Elizabeth's Point is the ^{Elizabeth's} north point of Back Bay, Trincomalay, off which lie 2 rocks above water, about the ^{Point.} bigness of a boat, and are about $\frac{3}{4}$ of a mile from the shore; and from them to seaward runs out a reef of rocks under water, for $\frac{1}{4}$ of a mile, having 7 or 8 fathom water close to them, and much about the same water close to the rocks, both to the northward and southward of them; therefore come no nearer them than 12 or 13 fathom, nor to the shore, to the northward of them, than 17 or 18 fathom, the bottom being foul, and the soundings very irregular in that depth of water, but more so under that depth. These rocks bear from the outer part of Pigeon Island S. by E. $\frac{1}{2}$ E. 9 or 10 miles, and from the Flag-staff Point N. by W. $\frac{1}{2}$ W. 3 or 4 miles. If you keep Chapel Point just open with the Flag-staff Point, it will bear south a little westerly; and this mark will carry you clear of all danger from these rocks, in 12 and 13 fathom water.

If

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If you keep out in 25 or 30 fathom between the above-mentioned rocks and Flag-staff Point, you will soon be off the bank, and lose soundings; for there are no soundings further than 2 miles off the shore hereabouts; and off the Flag-staff Point, not above $\frac{1}{4}$ of a mile off, you will have 100 fathom, or, perhaps, no ground.

Being off the Flag-staff Point, with the wind fair, and you bound into Trincomalay Harbour, you may borrow as near as you please to the Flag-staff Point, there being 17 or 18 fathom within a ship's length of it, and no danger.

Reef off
Chapel
Point.

Between Flag-staff Point and Chapel Point there are rocks that appear above water, and run out some distance into the sea, but are pretty steep to: and a large 4th of a mile off Chapel Point there lies a rock above water, about the bigness of a small boat, from which a reef of rocks, under water, runs right out to seaward, about a large cable's length: however, the white mark on the inside of Elizabeth's Point, kept about a sail's breadth open with the Flag-staff Point, carries you clear of all danger hereabouts, in 18, 20, or 22 fathom.

To steer up
the bay, &c.

Being past the rock and reef off Chapel Point, you may steer up the bay; and keeping Marble Point open to the northward of Round Island, till you open the harbour's mouth, carries you clear of all danger; but you will have no soundings. Then keep mid-way between Round Island and Elephant Island, and steer in for the harbour's mouth N. W. by N. as before directed, in coming from the southward.

Leading
mark in and
out the bay.

Marble Point, a sail's breadth open to the northward of Round Island, is the leading mark both in and out of the bay, carrying you clear also of all danger on the south side of the bay; and pass the shoal off Foul Point in 12 fathom.

Marks for turning into Trincomalay Harbour.

Foul Point.

A ship off Foul Point standing to the northward, and bound into Trincomalay Harbour, with the wind westerly, as it most commonly is during the S. W. monsoon, may borrow, on the back of the shoal off Foul Point, into 14 or 15 fathom. And when you open Marble Point to the northward of Round Island, you may keep up for Flag-staff Point, if the wind will let you: for a considerable space between these 2 points there are no soundings, although you have soundings for 1, or $1\frac{1}{2}$ mile to the northward of Foul Point. I have very carefully sounded about Foul Point several times, and found gradual soundings approaching it every way. I have had gradual soundings from 4 to 36 fathom, on the edge of the bank, when Flag-staff Point bore W. $\frac{1}{2}$ N. and Foul Point S. $\frac{3}{4}$ E. and the next cast no ground.

The best way to get into the Harbour, with the wind off shore, is to work up under the Flag-staff Point, and to the northward of it, taking care not to stand to the southward, so as to open the great bay, until you can pass the reef off Chapel Point with the leading mark for clearing the same, as above mentioned, on account of the strong outset which generally accompanies the westerly winds. When you stand to the northward, there is nothing to fear but what you see. Between the rocks off Elizabeth's Point and the Flag-staff Point you may stand in to 8 or 7 fathom, the bottom being clear and sandy, with gradual soundings from 20 to 7 fathom. When you tack, and stand to the southward, keep as close to the Flag-staff Point as possible, and borrow as near the rock and reef that lies off Chapel Point as you can, observing the leading mark in the former direction.

Northeast R.

In standing over towards the south shore, take this precaution; do not be too bold in standing towards it; for between Foul Point and Norway Island it is all rocky and foul ground, with very irregular soundings, shoalening 4, 5, or 6 fathom at a cast: therefore by no means stand into less than 20 fathom; for about half-way between Foul Point and Norway Island lies a very dangerous rock, with only 8 feet water on it, called the Northeast

Rock,

Rock, so called from a store-ship of that name being lost thereon in the year 1748; on which you have the following bearings: Flag-staff Point N. 35 deg. W. a hill in the country, and Marble Point, touching W. 10 deg. S. Norway Island S. 38 deg. W. Foul Point E. 10 deg. N. There are 8 and 9 fathom all round it, and 15 and 18 fathom a very little way without it. In short, I would not advise you to stand further to the southward, until you get well to the westward of Norway Island, than just to bring Round Island on with, or touching, Marble Point. With which bearings you will have soundings from 18 to 20, 22, and 24 fathom, all the way between Foul Point and Norway Island, and, when a-breast Norway Island, 13, 14, or 15 fathom.

When you tack and stand to the northward again, you will lose soundings: if you stand in with Chapel Point, (off which lie a parcel of rocks above water, called Chapel Islands) there is no danger but what you see. These rocks, and all the north side of the bay to Elephant Island, and that island also, are steep to, and no danger but what may be seen, the land being high, and no soundings on this side the bay, a cable's length from the shore.

When you tack and stand again to the southward, be careful how you stand towards Norway Island; for without it, within it, and all round it, are rocks above and under water; which makes it very dangerous coming near it: therefore be careful to observe the marks above given, for keeping clear of any danger on the north side of it.

When you can weather Norway Island, you may stand a good way further to the southward of the great bay of Trincomalay; but observe this caution: Being off Norway Island, or a little within it, in standing to the southward you will often meet with large flaws of wind, which will invite you to stand on, and make you imagine you can weather away Norway Island: yet be not too desirous to stand on that way too soon; for to the S. W. of Norway Island, and a great way out into the bay, lies a large flat sand-bank, on which there are only 3, $3\frac{1}{4}$, and $3\frac{1}{2}$ fathom: and what makes it the more dangerous is, that it is steep to, having no soundings a very little way without it; and from 15 or 16 fathom, in half a ship's length you will have $3\frac{1}{2}$ or $3\frac{3}{4}$ fathom. The marks to clear the said shoal are, to keep the great tree on the middle of the flag-staff point of land on with Chapel Point, or just touching it; and this will carry you clear to the westward: but, if you find you open the tree with the point, as you stand on, tack to the northward again, in order to keep the mark shut in or touching, when you stand to the southward again; which when you can do, you may with safety stand over for the south side of the great bay; and when you open the small island in the mouth of the lake to the southward of Pigeon's Island, you are clear to the southward of it.

In standing to the south side of the great bay you will have no soundings until you are within a mile of the south shore: however, you must keep your lead going; for it shoalens very suddenly: you may have, the first cast, 35 or 40 fathom; the next, perhaps, 18 or 20 fathom; and the next, 10 or 12 fathom. Into less than 12 or 14 I would not advise you to go with a great ship, but tack immediately to the northward; for from 12 to 4 fathom is not above 2 cables length, and in some places not above 1. In some places 4 fathom is $\frac{1}{4}$ or $\frac{1}{2}$ a mile from the shore; therefore the distance from the shore may be the more apt to deceive you.

The most gradual soundings, on the south side the bay, are off the river Cotiar; and the soundings are further off shore, opposite this river, than any other part of the bay. I have anchored off this river, in from 10 to 12 fathom, fine, soft, muddy bottom, and clear, good, holding ground; the river's mouth bearing S. by E. about $\frac{3}{4}$ of a mile, where it is very smooth lying in the S. W. monsoon.

Small ships may anchor in 7, 8, or 9 fathom, any where along shore, between Cotiar river and Sambor, or the easternmost river; good ground, muddy bottom, smooth water, and ships.

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and safe anchorage, $\frac{1}{4}$ a mile from the shore. I have very carefully sounded all this bay, and my remarks may be depended on.

To fetch
into the
harbour.

As I have mentioned above, that in standing towards the south side of the great bay, when in 14 or 12 fathom, you should tack to the northward; now, by so doing, (supposing the wind westerly, as I have supposed it all along) you will lie up for Round Island, and must go close under the lee thereof, it being steep to, which will enable you to fetch into the harbour with a full sail. As you pass through the harbour's mouth, keep close on board the weather-shore, on which you may borrow within a ship's length any where, and so run into the harbour, and anchor where you please, as before directed.



Remarks and Directions for making a Passage from the Coast of Coromandel to Bombay, in the South-West Monsoon, &c.

The consequence of ships stretching off from Madras.

How they are prevented getting to the southward.

To keep up along the coast as far as Negapatam.

From Negapatam to stretch over for Ceylon.

To coast it along Ceylon to the Friar's Hood

Long. to cross the Line in.

I Have known several ships that have made this passage in the S. W. monsoon, though it is both tedious and troublesome: those that stretched directly off the Coast of Coromandel from Madras have met with strong northerly currents, and the winds, which generally hang much southerly; so that they have not been able to fetch any further than Acheen Head, and there have been hampered with southerly winds and northerly currents, which have prevented their getting to the southward, and made their passage both long and troublesome: some have been three, and others four months in making this passage, which in common is reckoned a ten-weeks passage; whereas it may be made in six weeks with great ease, by taking the proper methods, &c.

If I were to make a passage from Madras to Bombay, in the S. W. monsoon, I would work up along the Coromandel Coast from Madras as far as Negapatam, by taking the advantage of the sea and land winds, and would anchor when the wind and current were against me: this passage from Madras to Negapatam may be made in 10, 12, or 14 days at most, in any month of the year, but May, or the latter end of April, at which time the current runs very strong to the northward. In June, July, or August, ships generally make a passage from Madras to Negapatam in 9, 10, or 11 days; and when you have got to Negapatam, the worst part of the passage is over, or it may be said to be made sure; for there you will meet with strong land-winds, which will run you over to Ceylon in 48 hours, as I have several times run from Negapatam, and anchored in Back Bay at Trincomalay in 48 hours. And all along the N. E. part of Ceylon you will meet with strong westerly winds, which will run you to the southward very quickly. I would advise you to coast it along Ceylon as far as the Friar's Hood, which I have done with the westerly winds from Trincomalay in two days. From the Friar's Hood I would stretch off, and take my departure from it: and having brisk gales at S. W. and W. S. W. I have crossed the Line the third day from the Friar's Hood. Longitude, made from the Hood, 5 deg. 26 min. E. variation 37 min. W. In latitude 2 deg. or 2 deg. 30 min. S. you meet the S. E. trade-winds. I would run to the southward, into 9 deg. 30 min. or 10 deg. S. where you will have the S. E. trade-winds blow fresh; and there I would run down my westing: about 14 or 15 deg. westing, from the Friar's Hood, will be sufficient. The land near the sea off the Friar's Hood, when it bears west, lies in 7 deg. 16 min. N. and longitude, by computation, 82 deg. 8 min. E. from London. The longitude of Scuhelipar, which is one of the

the westernmost of the Laccadive Islands, is 72 deg. 24 min. E. from London; so that the difference of longitude between the Friar's Hood and Scuhelipar is 9 deg. 44 min. W. and if you go 4 or 5 deg. to the westward of the Laccadives, you will be far enough to the westward, which will make near 14 or 15 deg. westing from the Friar's Hood.

Being in the latitude 9 deg. 30 min. or 10 deg. S. I would steer so as that, by the time I had made 9 deg. 30 min. or 10 deg. of west longitude from the Friar's Hood, I would have reduced my latitude to 3 deg. or 3 deg. 30 min. S. From hence I would steer to the westward, till I had made 4 deg. 30 min. of longitude more, by the time I had got into the latitude 2 deg. S. This track leads between the islands called Yas de Digo Rayes and the shoals Bassas de Chagos. Those who have made the Islands Yas de Digo Rayes going this track, say they are pretty high: I have seen them set, in ships journals, from N. N. E. to N. E. distant 8 or 9 leagues; but I know no business that ships have near them. They are a large cluster of islands, the body of them supposed to lie upon the Line, and pretty near upon a meridian with the westernmost of the Laccadive Islands. I would cross the latitude of them, or any other islands, or shoal, in the day-time.

Being in lat. 2 deg. S. and longitude, made from the Friar's Hood, about 14 deg. 30 min. W. I would then cross the Line, and steer to the northward: hereabouts the variation begins to increase. Before you cross the Line you will meet the S. W. monsoon; and as soon as you get into north latitude you will have fresh gales, and hazey dirty weather, and the more so as you run to the northward.

Having crossed the Line in the above-mentioned longitude, 14 deg. 30 min. W. from the Friar's Hood, with this westing you will steer to the northward, taking care to keep up your westing; and let me remind you that the Coast of Malabar lies N. N. W. and S. S. E. so that a north course will carry you in upon the shore, and a N. N. W. course will but carry you parallel to the Coast of Malabar. I have seen, by ships journals, that, for the want of this consideration, they have fallen in with the coast sooner than they intended, by steering north.

In failing this track the variation increases to about 3 deg. or 3 deg. 30 min. W. which, if properly attended to, will correct your longitude. I have failed this track, and very carefully observed the variation, which I would recommend as your principal and sure guide, in failing along the track above mentioned. In latitude from 8 to 10 deg. N. and 7 deg. to the westward of the Laccadive Islands, you will have 4 deg. 12 min. W. variation. And in the above latitudes you will have variation 3 deg. 30 min. W. 5 deg. 30 min. to the westward of these islands. Also, if the variation be 2 deg. 27 min. or 2 deg. 30 min. W. you will be 3 deg. 30 min. to the westward of these islands. Likewise, in the above latitudes, the variation being 1 deg. 27 min. or 1 deg. 30 min. W. you will be 2 deg. to the westward of these islands. And you will have 1 deg. 5 min. or 1 deg. 8 min. W. variation, in sight of these islands. When you have the variation as above, you may depend upon being the several distances to the westward of the Laccadive Islands.

If you make westing, you will increase your variation; if easting, you will decrease it.

In latitude from 11 to 12 deg. N. you will have variation 3 deg. 5 min. W. 8 deg. 26 min. to the westward of Goa. In latitude from 12 to 14 deg. N. you will have variation 3 deg. and 3 deg. 5 min. W. 7 deg. to the westward of Goa. In lat. 14 deg. 30 min. N. you will have variation 2 deg. 12 min. W. long. 3 deg. 30 min. to the westward of Goa. In lat. 15 deg. and 15 deg. 30 min. N. you will have variation 1 deg. 28 min. or 1 deg. 30 min. 2 deg. to the westward of Goa. Off Goa, in sight of the land, in lat. 15 deg. 30 min. you will have variation 42 min. W.

If

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What variation will carry you parallel to the coast.

If a ship keep in 2 deg. 30 min. W. variation, she will go far enough to the westward, and will keep clear of every thing, in going the outer passage to Bombay; and if you keep in 3 deg. W. variation, it will carry you along to the northward, parallel to the coast, which is as safe and unerring a guide as the sun at noon for discovering the latitude.

The parallel you are to steer to the eastward for Bombay.

Steer to the northward till you get into the latitude of 18 deg. 50 min. which is the proper latitude to steer to the eastward for Bombay; but you must make an allowance, in the course steered, for a southerly current, which, in the S. W. monsoon, you generally find setting along the coast, from 15 to 20 and 24 miles in 24 hours. Steer to the eastward in the parallels of 18 deg. 50 min. N. till you have soundings, which you have full 30 leagues off the coast, at 80 or 90 fathom, and which shoalen very gradually. For further particulars see my Directions for ships bound to Bombay, in p. 14.



Remarks on a Passage from Madrafs to Manilla, through the Straits of Malacca, in the South-West Monsoon.

Sailed from Madrafs.

THE usual time for sailing from the Coromandel Coast, for the China Seas, through the Straits of Malacca, is May, June, or July; for the beginning of August is rather late, though ships may then save their passage to China, &c. We sailed from Madrafs the 30th of July, 1762, for Manilla, and the next day had fresh gales from W. by S. to S. W. by S. with thick, hazey weather, some hard squalls, and rain; also found a southerly current of 20 miles in the 24 hours; yet, the 2 succeeding days, found no current at all; which is a further proof of what I elsewhere asserted, that the nearer the land, the stronger the current. The rest of our passage cross the Bay of Bengal, we had a small current, sometimes to the northward, and sometimes to the southward, but rather more to the northward, especially in drawing near the islands. On the 6th of August, at 9 P. M. saw the land, which proved to be the Nicobar Islands: we went through the Sambrere Channel, in lat. 7 deg. 36 min. N. and made 11 deg. 41 min. E. long. from Madrafs to the northernmost of the Nicobar Islands; the variation 23 min. E. It being night-time when we made and passed these islands, I can give no other description of them, than that they appeared by moon-light to be pretty high land.

Nicobar Islands.

Pulo Buton.

At midnight we took our departure from the N. E. part of the northernmost of the Nicobar Islands, in lat. 7 deg. 25 min. N. and steered for Pulo Buton, which we saw on the 8th, at 6 A. M. In this run had variable winds, with cloudy weather and smooth water; found no current, though we saw strong riplings. When Pulo Buton bore E. by N. $\frac{1}{2}$ N. 6 or 7 leagues, sounded; no ground 150 fathom. By several observations, found no variation. This is a large, high island, in lat. 6 deg. 30 min. N. bearing from the N. E. part of the northernmost of the Nicobar Islands, E. 13 deg. S. 97 or 98 leagues, with several small ones near it, and may be seen 10 or 12 leagues in clear weather. Hereabouts you see the high land of Malayo at a great distance.

Pulo Pera.

Having made Pulo Buton, direct your course for Pulo Pera, so as to go to the eastward thereof. Between these you may see the islands of the Great and Little Ladda, or Pepper Islands, which are high islands to the northward of Pulo Pisang. Pulo Pera is a small rocky

rocky island, in lat. 5 deg. 50 min. N. bearing about S. S. W. 15 leagues from Pulo Buton, and may be seen 8, 9, or 10 leagues in clear weather. It is steep to on all sides. You have 45 fathom water within 2 or 3 miles of it; and 5 or 6 miles off, you have no ground 50 fathom; but when it bore N. W. 5 or 6 leagues, had 45 fathom, sandy ground. From hence direct your course for Pulo Jarra, bearing S. S. E. $\frac{1}{2}$ E. 42 leagues: you have soundings between them from 35 to 25 fathom, sometimes fine white sand, and sometimes sand and mud. It is best passing to the eastward of Pulo Jarra, for the conveniency of the tides, and anchoring if the winds should be contrary.

Though we went through the Sombrere Channel, yet I would rather advise going to the southward of the Nicobar Islands, as the shorter cut, which, when attended with no more difficulty or danger, must certainly be the best. The S. W. part of the Nicobar Islands lies in 6 deg. 45 min. N. and longitude, by run from Madras, 11 deg. 40 min. or 12 deg. E. The Nicobar Islands are pretty high, and may be seen 10 or 11 leagues in clear weather. Being off the S. W. part of the Nicobars, you may either make Pulo Rondo, or shape a course directly for Pulo Pera, bearing therefrom E. by S. 100 leagues: and if you make Pulo Rondo, Pulo Pera bears from it E. 4 deg. S. 74 leagues.

Pulo Rondo is a small, but high, rocky, round island, in lat. 6 deg. 5 min. N. bearing from Acheen Head N. by W. 11 or 12 leagues; from the N. E. part of the Nicobars, S. E. $\frac{1}{4}$ S. 36 leagues; and from the S. W. part, E. 30 deg. S. 28 leagues. Off the south and S. W. sides of this island there are many small rocks above and under water; but it is clear and bold on the north side. The variation off this island, in 1763 and 1764, was 14 min. W. This is much such another island as Pulo Pera, being about the same height, but exactly round; wherefore I suppose it was named Pulo Rondo, or the Round Island. From hence may be seen the high mountains of Sumatra, bearing S. S. E. $\frac{1}{4}$ E. or S. S. E. $\frac{1}{2}$ E. Pulo Braffa south, 6 or 7 leagues, and Pulo Way S. S. E. $\frac{1}{2}$ E. 4 leagues. Pulo Way and Pulo Braffa are both high islands, but Pulo Way is much the largest and highest of the whole cluster. The longitude, as allowed by most navigators, is 11 deg. 30 min. E. from the Great Baffes, which will make about 93 deg. 15 min. E. from London. Being off Pulo Rondo, by falling in 5 or 6 leagues to the southward of Pulo Pera you will cut off some distance; and then direct your course for Pulo Jarra: you will have no soundings in this track till you get to Pulo Pera.

I have known ships take a different track from either of those above mentioned, which has succeeded very well, and makes the run much shorter than either of them. They sailed from Madras, and made Pulo Rondo, passing to the northward thereof, and steered directly for Pulo Jarra, lying from it E. S. E. $\frac{1}{4}$ E. 104 leagues. We sailed from Madras 2 days before these ships, steering, as above related, through the Sombrere Channel, and thought we had a pretty good passage; yet they got to Malacca 2 days before us: nevertheless so quick a passage, by this track, is very uncertain, and therefore not always to be practised; since, if you should have calms and the currents against you, (as is generally the case, in the S. W. monsoon, on the Sumatra side) there is no anchoring. The same indeed may be said of the passage from the Sombrere Channel to Pulo Buton, or to Pulo Pera, which is nearly the same distance as from Pulo Rondo to Pulo Jarra; and that therefore the latter passage may be made as soon as either of the former, and thereby a considerable part of the distance cut off; consequently, if the winds might be depended on, this would be the best and most expeditious method of making a passage. But it has been found by experience, that passages have generally been more expeditiously made on the Mally Coast, which is less subject to calms, and where you have little or no current; but rather a tide, which is alternately in your favour; and where you may anchor when the wind or

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tide is against you, and keep what you have got: which are sufficient reasons why ships should rather keep along the Mallay Coast, notwithstanding the success of the ships above mentioned.

Pulo Jarra. Pulo Jarra is a small, round, high island, in lat. 3 deg. 57 min. N. and has soundings from 30 to 35 fathom, all round it, within 6 or 7 leagues. You may pass on either side this island, which is steep to, having 30 and 35 fathom close to it. Hereabouts you generally have the current setting to the N. W. at the rate of 20 miles in the 24 hours; which current you mostly have all along the Mallay shore, in the N. E. monsoon; but the reverse on the Sumatra shore, where you find a southerly current. When Pulo Jarra bore N. W. 4 leagues, had 34 fathom; and when it bore N. W. $\frac{1}{2}$ N. 8 or 9 leagues, had 32 fathom.

Bearings & distance of several islands from Pulo Jarra. Between Pulo Pera and Pulo Jarra, but well in with the Mallay Shore, lies Pulo Pinang, a large and high mountainous island, in lat. 5 deg. 25 min. N. bearing from Pulo Pera E. S. E. $\frac{1}{2}$ S. 24 leagues, and from Pulo Jarra N. $\frac{1}{4}$ W. 26 leagues. The Sambelongs, which are a cluster of small islands, bear off Pulo Jarra from E. $\frac{1}{2}$ S. to E. by N. distance 8 or 9 leagues: and from Jarra, Pulo Ding-ding bears E. N. E. $\frac{1}{2}$ N. 10 or 11 leagues. Pulo Varela is a high island, and bears from Jarra W. by S. $\frac{1}{2}$ S. 15 or 16 leagues: and the Pulo Arroes lie from Pulo Jarra S. by E. $\frac{1}{4}$ E. 25 or 26 leagues.

From Jarra to the Arroes. Steer from Jarra for the Arroes, S. S. E. and you will have very regular soundings, from 32 to 37 fathom, between them; but when the Arroes bear from S. by W. $\frac{1}{2}$ W. to S. S. W. $\frac{1}{2}$ W. distance from 3 to 5 leagues, you will deepen your water to 40 and 44 fathom: when the easternmost Arroe bears S. W. $\frac{1}{2}$ W. you have 22 fathom; and when it bears S. W. by W. 2 $\frac{1}{2}$ leagues, and the Long Arroe W. $\frac{3}{4}$ S. you have 11 or 12 fathom.

Pulo Arroes The Pulo Arroes are a number of great and small rocks, extending E. S. E. and W. N. W. 3 or 4 leagues. One of them is a long, low island, with trees upon it, in lat. 2 deg. 50 min. N. and is called the Long Arroe. The easternmost is a pretty high, round rock, covered with trees, and is called the Round Arroe: its lat. is 2 deg. 45 min. N. This Round Arroe is a leading mark through the channel, between the N. and S. sand-heads, and may be seen from a large ship's poop, in clear weather, 7 or 8 leagues; but none of the other rocks above 4, 5, or 6 leagues. It flows at the Arroes on the full and change, E. and W. or 6 hours: the flood S. E. by S. and the ebb N. W. by N. each way 6 hours; strong tides, which occasion great riplings, as if in shoal water, or danger, though there is none: but as the tides have great dependence on the winds, I have known several instances of their irregularity, the ebb running strong for 9 hours together in the N. E. monsoon; and the flood as long in the S. W. monsoon: the variation 36 min. W.

The channel between the Arroes and the N. Sand. Between these rocks and the North Sand is the channel, by which ships generally pass through these straits. When the Arroes bear S. W. distance about 8 or 9 leagues, you are on the edge of the North Sand, and have soundings from 20 to 15 and 9 fathom; from whence, if the weather be clear, you may just see Parcelar Hill, bearing about E. S. E. 13 or 14 leagues: but I would not advise any ship to keep so near the North Sand, but rather within 3 or 4 leagues of the Arroes. In steering S. W. towards them from the last bearings, you will deepen your water, as you cross over, from 9 or 10 fathom, on the edge of the North Sand, to 15, 25, 40, 45 fathom, about mid-channel: from thence, still standing to the southward towards them, the water shoalens gradually from 44 to 40, 30, 25, 20, 15, to 12 fathom, ouzey ground, within 2 leagues of the Arroes, about mid-way between the Long and Round Arroe.

Before I proceed to give directions for crossing over from the Arroes to the Mallay Shore, through the channel, between the North and South Sands, &c. I shall give you as clear and distinct an account, as I can, of the dangers that lie in the way, with their bearings and

and distances from the most remarkable places, the marks to go clear of them, as also the true soundings, &c. that, by giving you a clear and distinct idea of the channel you are to go through, you may know the better how to avoid the dangers.

Pulo Parcelar, commonly called Parcelar Hill, lies in lat. 2 deg. 48 min. N. and bears Parcelar from the high, round, or easternmost Arroes, E. 3 deg. N. 16 or 17 leagues. This is a Hill. single remarkable high hill near the shore on the Mallay Coast: the rest of the islands or land near it, being very low, cannot be seen at any great distance. This hill, therefore, being the only thing you can see on the Mallay Shore, is the leading mark through the channel, between the North and South Sand-Heads. The variation 16 min. W.

The North Sand lies about N. N. W. and S. S. E. it is reckoned 9 or 10 leagues in length, and is very dangerous: the south part thereof is commonly called the North Sand-Head, which bears, from the Arroes, E. by N. $\frac{3}{4}$ N. distance 8 leagues, and from Parcelar Hill, W. by N. 9 or 10 leagues. In like manner the north part of the South Sand is commonly called the South Sand-Head, and bears, from the Round Arroes, E. $\frac{1}{2}$ S. about 7 leagues; and from Parcelar Hill W. $\frac{1}{2}$ S. 9 or 10 leagues. This sand lies S. E. by E. and N. W. by W. in length about 12 leagues. The distance between these sand-heads is reckoned about $3\frac{1}{2}$ leagues, with very irregular soundings from 25 to 8 fathom between them. It is said there are several shoals to the northward and eastward of the North Sand, which I shall say nothing of, as they lie out of the track of a ship coming through this channel: but there is a hard shingly bank, with some sand, lying in the Fair-way, that has only $2\frac{1}{2}$ and 3 fathom on it, and consequently very dangerous; from whence Parcelar Hill bears E. 3 deg. S. and the low land, or the trees on the low land, just seen from the poop, distance about 6 or 7 leagues; and the Round Arroes, seen from the main-top, bearing W. 9 deg. 30 min. N. The author of the New Directory mentions the above shoal, whose directions for this channel, and all the straits of Malacca, are the best that I have seen.

There are 2 banks in this channel, both of which you pass over in almost the same depth of water, and very hard ground between them: you have from 15 to 18, 20, and 22 fathom water. The westernmost is between the North and South Sand-Heads. By keeping Parcelar due east, 9 or 10 leagues, and the Round Arroes W. 8 deg. S. 7 or 8 leagues, you will have no less than 10 or 11 fathom on it; but if you bring the Round Arroes to bear W. by S. $\frac{1}{2}$ S. you have only 8 or 9 fathom, which is too far to the northward. In going from this bank to the westward you soon deepen your water to 19, 20, and 24 fathom, and shoalen it as suddenly, going to the eastward. Be sure of your bearings, and there is no danger. The shoalening on the easternmost bank is 9 fathom: Parcelar Hill due east 6 or 7 leagues, or the trees on the low land about Parcelar just in sight from the poop, and the Round Arroes W. 6 deg. S. You are then a-breast the $2\frac{1}{2}$ fathom bank, and it is not more than $1\frac{1}{2}$ or 2 miles to the northward of you; towards which it shoalens gradually to 5 and 4 fathom.

Between the North and South Sand, and Parcelar, the tides run strong; the flood S. E. by E. and the ebb N. W. by W. It flows at full and change E. S. E. and W. N. W. or $7\frac{1}{2}$ hours; and it ebbs and flows perpendicular 8 or 9 feet.

If a ship, coming from the Arroes and crossing over to Parcelar, has a foul wind, and is obliged to turn through the channel, it is allowed, by most navigators, that she may bring Parcelar Hill to bear from E. $\frac{3}{4}$ S. to E. $\frac{1}{4}$ N. between the North and South Sand-Heads. But when a ship has got so far to the eastward, as to lose sight of the Round Arroes upon deck, and before she has sight of the low land about Parcelar, she must not stand to the northward further than to bring Parcelar Hill due east; for E. $\frac{1}{4}$ S. will bring her on the $2\frac{1}{2}$ fathom bank, as before mentioned; but she may stand further to the southward, and bring Parcelar Hill to bear E. $\frac{1}{2}$ N. and when she gets sight of the low land of

Parcelar Hill.

North and South Sand-Heads, and the channel between them.

Two banks between the North and South Sands

Tides.

To turn it through the channel.

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of Parcelar, may bring the hill E. by N. or more northerly, without any danger. Notwithstanding, I would advise the keeping a boat a-head to sound, as is commonly done in this channel.

Having a leading wind.

If at the Arroes you have a leading wind through the channel to Parcelar, shape your course, with respect to the tides and winds, so as to keep the Round Arroe from W. $\frac{3}{4}$ S. to W. $\frac{1}{4}$ S. but W. $\frac{1}{2}$ S. is the best bearing: steer then till you get sight of Parcelar Hill; then keep the hill due east, till you get sight of the low land about Parcelar, when you may bring the hill to bear E. by N. or more northerly, and run within 2 or 3 leagues of the low land about Parcelar.

Having given the bearings and marks for the sands and dangers that lie in the way of crossing over from the Arroes to Parcelar, and also the marks to avoid them, with the true soundings, &c. I shall now give a short direction for going through the channel, with the different depths of water you meet with in crossing over.

Soundings in a direct course, thro' the channel, from the Arroes to Parcelar.

Being off the Arroes, within 3 leagues of them, in 12 or 14 fathom water, shape your course, with respect to the tides and winds, so as to keep the Round Arroe from W. $\frac{3}{4}$ S. to W. $\frac{1}{4}$ S. till you get sight of Parcelar Hill, as above directed, in which track you will have irregular soundings from 12 or 14 to 18, 20, and 25 fathom; and when the Round Arroe bears W. 8 deg. S. 6 or 7 leagues, you will soon shoalen your water to 12, 10, and 9 fathom, when you are on the westernmost bank, and between the North and South Sand-Heads. Parcelar bearing off you E. or E. $\frac{1}{2}$ S. is pretty good bearings hereabouts. Keep Parcelar Hill due east, and you will have 9 and 10 fathom on this westernmost bank, and soon deepen to 15, 18, 20, 22, 23 fathom, when you are between the westernmost and easternmost banks; and as soon as you begin to lose sight of the Round Arroe upon deck, you are coming upon the easternmost bank, and will shoalen your water to 15, 12, 10, 9 $\frac{1}{2}$ fathom; and when you can just see the trees on the low land about Parcelar, you are a-breast of the 2 $\frac{1}{2}$ fathom bank: if Parcelar Hill bears due east, it is then 1 $\frac{1}{2}$ or 2 miles to the northward of you: you are then also clear of the South Sand, and may steer more southerly, so as to bring Parcelar Hill E. by N. or even more northerly. By continuing your course to the eastward you will soon deepen your water again to 14, 16, 18, 20, 22, and 24 fathom, ouze; and from 24, shoalen again to 17 or 18 fathom, 5 or 6 miles off the low land of Parcelar.

From Parcelar to C. Richado.

Between Parcelar and Cape Richado the coast forms a deep bay. The channel between the South Sand and the Mallay Coast is about 4 leagues wide. The soundings between Parcelar and Cape Richado are from 15, 20, 25, 30, to 35, and in some places 40 fathom, ouzey ground; but, in general, very irregular, deepening and shoalening several fathoms at a cast; so that in the night-time there is no judging by the soundings where you are. The ground is all ouze, excepting about the middle of the channel, Parcelar bearing N. E. by E. about 2 leagues off shore, there is a small bank of 13 fathom, sand, gravel, and small stones. Also within the bight N. W. $\frac{1}{4}$ N. 4 or 4 $\frac{1}{2}$ leagues from the cape, and S. E. by S. from Parcelar Hill, about 2 or 3 miles off shore, there lies a bank of sand, whereon some ships have been lost: by keeping the cape E. S. E. $\frac{1}{2}$ S. or E. S. E. $\frac{3}{4}$ S. and Parcelar Hill N. N. W. or N. N. W. $\frac{1}{2}$ W. you may go 2 or 3 miles without it, in 16, 18, or 20 fathom water; and keeping in from 18 to 22 fathom, between Parcelar and Cape Richado, will lead you in a good channel from 4 to 6 miles off shore.

C. Richado.

Cape Richado is a high bluff point of land, and steep to, (something like Mount Dilla on the Coast of Malabar, only not so high) stretching out to seaward in a long narrow point of land, which forms a deep bay on each side of it, with a small rock or island near its extremity: it lies in lat. 2 deg. 28 min. N. and bears, from Parcelar Hill, S. E. a little southerly, about 13 leagues. About a league without the cape you may see the low land of

Sumatra

Sumatra from the deck, this being the narrowest part of the straits to the northward of Malacca.

Here the tides run strong, flowing, on the full and change, N. W. and S. E. or The tides 9 hours; the flood to the southward, and the ebb to the northward. The soundings are and sound- uneven and irregular, from 15 or 16 to 30 fathom: within 2 or 3 miles of the cape you ings be- will have 22, 23, or 25 fathom, and only 15, 16, and 18 fathom, at 2 or $2\frac{1}{2}$ leagues, the Richado & cape bearing E. N. E. and then, 3 or $3\frac{1}{2}$ leagues to the westward of the cape, you will the South have 30 and 35 fathom; and then from 35 fathom it shoalens suddenly to 10 fathom, hard Sand. ground, on the South Sand.

About 2 leagues E. by S. from Cape Richado, is the mouth of the River Lingin, a R. Lingin. place that produces much tin.

From Cape Richado Malacca Hills bear E. by S. $\frac{1}{2}$ S. and the Great Water Island S. E. From Cape $\frac{1}{2}$ S. about 12 leagues; but the course to Malacca Road is S. E. by E. about 10 leagues. Richado to Malacca. You have soundings from 16 to 20, and 25 fathom, from 3 to 6 miles off shore, ouzey ground; only, when Cape Richado bears N. W. 3 or 4 leagues, and about 4 or 5 miles off shore, there is a hard bank of 13 fathom; but within, as well as without it, 20 and 24 fathom. Also, about mid-way between Cape Richado and Malacca Road, lies a rock above water, about a mile off shore; but that cannot be reckoned dangerous, as no ships have occasion to come so near the shore.

There is no danger going into Malacca Road. If you are in the offing in 20 or 23 Malacca R. fathom, you shoalen your water gradually to 7 fathom as you run in for the road. I would not advise a great ship to go into less than $7\frac{1}{2}$ fathom, for it shoalens suddenly from 7 to 5 and 4 fathom. And ships should be still more careful not to go too far to the southward, or the S. E. part of the bay, where the ground is foul and rocky, and shoalens suddenly from 8 to 3 fathom. Likewise off Woody or Fisher's Island there is no danger, as some directions mention: I have found well about it, and found that a ship, upon occasion, might go within $\frac{1}{2}$ a mile of it, in 16 fathom water; or have 10 fathom within $\frac{1}{4}$ of a mile of it, and 20 fathom about a mile without it. You may anchor in Anchorage Malacca Road from 13 to $7\frac{1}{2}$ fathom, ouzey ground. Malacca Church on the N. W. part of Mount Moora E. 27 deg. 30 min. N. the S. W. part of Woody or Fisher's Island W. 36 deg. 15 min. N. and the outermost of the Four Brothers, or Water Islands, E. 50 deg. 20 min. S. distance from Malacca $1\frac{1}{2}$ mile. It flows in Malacca Road S. S. E. and N. N. W. or $10\frac{1}{2}$ hours: the flood runs E. S. E. and the ebb W. N. W. pretty strong tides. Half- Tides. flood in the road is high-water ashore: at $\frac{3}{4}$ ebb a ship's boat cannot get into the river.

Malacca lies in the latitude of 2 deg. 12 min. N. and the variation, by several obser- Malacca. vations, I made 1 deg. 24 min. W. Here the Dutch have a fort and very considerable settlement, which affords refreshments of all kinds in great plenty: the church stands upon a high hill in the middle of the garrison, and is always kept very white, which, together with its situation, makes it very conspicuous at a great distance, whereby Malacca may be easily known.

From Malacca sail without, or to the westward of, all the Water Islands, and you will From Ma- deepen your water gradually from 8 to 20 fathom: and from 3 to 6 miles without the lacca to Water Islands you will have from 20 to 25 fathom. Hereabouts the flood runs S. E. by S. Mount For- and the ebb N. W. by N. at the rate of $1\frac{1}{2}$ knot: the bottom ouzey, and good anchorage. mofa. Being without the Water Islands, steer S. E. by S. or S. E. for Mount Formosa, which is 11 or 12 leagues distant, in soundings from 20 to 24 fathom; but if the winds are contrary, you may stand over from 15 fathom on the Mallay Shore to 15 fathom on the Sumatra Shore, but no nearer. From the outermost of the Four Brothers, or Water Islands, which lies in lat. 2 deg. 4 min. N. Mount Moora bears E. by S. $\frac{1}{2}$ S. 7 or 8 leagues; and Mount Formosa E. S. E. $\frac{1}{2}$ S. 11 or 12 leagues. The 2 mounts or hills lie

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lie from each other S. E. and N. W. about 7 leagues, in lat. 2 deg. and 1 deg. 48 min. N. From the Water Islands to a-breast Mount Moora you have soundings from 20 to 26 fathom, ouzey ground, from 3 to 4 or 5 leagues off shore. The tides here are very uncertain, but set longest and strongest to the westward. From Mount Moora the course is S. E. by S. to Formosa Point and Rivers Mouth, off which, about 2 leagues, lies a shoal stretching along shore: from the S. E. end thereof, Mount Formosa bears N. E. by N. and Mount Moora N. W. by N. from the N. W. part of it Mount Formosa E. $\frac{1}{2}$ S. and Mount Moora N. and N. by W. Just without this there is another bank, whereon there is but 5 fathom, hard ground.

From Formosa to Pulo Pisang.

The channel broader hereabouts than imagined.

From Formosa Point to Pulo Pisang the course is S. E. by S. $7\frac{1}{2}$ or 8 leagues; and when Mount Formosa bears N. E. between 3 and 4 leagues, you will see Pulo Pisang bearing S. E. $\frac{1}{2}$ E. or S. E. by E. distance 7 or 8 leagues, and will then have soundings from 20 to 22 or 23 fathom, ouzey ground. The straits hereabouts are about 10 leagues broad. Ships always keep on the Mallay side, (on which they may borrow into 11 or 12 fathom with safety, on occasion) because off the opposite shore are many shoals, and foul ground. In the middle there is a bank which stretches E. S. E. and W. N. W. 8 leagues in length: from the westernmost part whereof Mount Formosa bears N. E. by N. and Pulo Pisang E. by S. about 8 leagues, or just in sight; and from the east end of this bank Pulo Pisang bears E. N. E. $\frac{1}{2}$ N. or N. E. by E. $2\frac{1}{2}$ or 3 leagues. Between this bank and Pulo Pisang is the common channel, the leading marks for which are, Formosa Hill N. N. W. $\frac{3}{4}$ W. and Carimons S. S. E. $\frac{3}{4}$ E. in 21 or 22 fathom, mid-channel; or from 9 to 10 or 12 fathom, 2 or 3 miles from Pulo Pisang, to 18 or 19 fathom on the sand side; from which it shoalens suddenly to 10, 9, 7, 5 fathom. The channel is but narrow, according to most navigators opinion, being, as they imagine, but 4 miles from the shoal, off the island, to the sand; but, in my opinion, the channel is, at least, 2 leagues wide, which I am well assured of by my own experience. For instance, when Mount Formosa bore N. $\frac{3}{4}$ W. and Pulo Pisang E. $\frac{1}{2}$ S. 4 leagues, and the Great Carimon Island S. E. had from 21 to 22 fathom water: we steered E. S. E. $\frac{1}{2}$ S. 6 miles, and had from 21 to 17 fathom, when Mount Formosa bore N. by W. $\frac{1}{2}$ W. and Pulo Pisang E. $\frac{3}{4}$ N. 6 or 7 miles. We steered the same course 5 miles, and had from 17 to 19 $\frac{1}{2}$ fathom, when Mount Formosa bore N. N. W. $\frac{3}{4}$ W. (which is the leading mark through between the island and the sand) and Pulo Pisang E. N. E. northerly, distance 4 miles: we then steered S. E. 3 miles, and had from 20 to 21 fathom: then Mount Formosa bore N. N. W. $\frac{3}{4}$ W. Pulo Pisang N. E. $\frac{1}{2}$ E. 5 miles, and the Great Carimon S. E. by S. when we were clear of the sand to the south-eastward of it. This proves the channel to be wider than the directories and most navigators believe it to be; or that we went without it. We were a fleet of 11 sail, and much scattered: several ships, without and within us, 3 or 4 miles, and none of them had shoalings on this sand.

Pulo Pisang.

Pulo Pisang is a pretty large, high, woody island, in lat. 1 deg. 23 min. N. bearing from Point Formosa S. E. by S. $7\frac{1}{2}$ or 8 leagues: it lies 5 or 6 miles off the Mallay Coast, and has 3 small islands by it. This island may be seen in clear weather 9 or 10 leagues, when it makes in a small hummock, like a boat turned bottom upwards. It flows here north and south; the ebb runs longest to the N. W. The variation, by several observations, I made 53 min. W.

Between Pulo Pisang, Cocob, and Carimons.

From Pulo Pisang Pulo Cocob lies S. E. $\frac{1}{2}$ E. $5\frac{1}{2}$ or 6 leagues, and the easternmost point of the Little Carimons S. S. E. $\frac{3}{4}$ E. 8 or $8\frac{1}{2}$ leagues. Between Pulo Pisang and Pulo Cocob you have soundings from 17 to 20 fathom, ouzey ground; and between Pulo Cocob and the Carimons from 17 to 20, 24 to 17 fathom towards the Carimons: and you should stand no nearer the Carimons than that depth: ouzey ground from side to side. Pulo Cocob is a low flat island, close in with the Mallay Shore, from whence the east point

of

of the Little Carimon bears S. S. W. about 4 leagues. Between these is the channel, of about 3 leagues in breadth. The Carimons are 2 pretty large and high islands, called the Little and the Great Carimon: they are both very high land; but the Great Carimon is the highest, and has a very high remarkable peak on it. But observe, that between Pulo Pisang and Pulo Cocob the Mallay Coast is flat and shoal; therefore, come no nearer it than 14 or 12 fathom, and bring Pulo Pisang no further to the westward than N. W. or N. W. $\frac{1}{4}$ N. nor stand nearer to the Sumatra Side than 15 fathom, under which depth is foul ground and shoal water; particularly when the E. point of the Carimons bears S. E. $\frac{1}{2}$ E. distance 4 or 5 leagues; and the outermost of the Two Brothers (2 small rocks) right on with it, about 3 leagues distance, and Pulo Pisang N. $\frac{1}{4}$ E. about 4 leagues: it shoals suddenly from 15 fathom soft, to 9 fathom hard ground. The Two Brothers bear from Pulo Cocob S. W. by S. Between them are good soundings from 24 to 15 fathom.

Tanjan-boulus is a point of low land on the Mallay Shore, bearing from the east point of the Carimons N. E. by N. distance about 4 leagues, and from Pulo Cocob, S. E. by E. 3 or 4 miles. The channel lies between these; and you may stand to each side in 16 fathom, soft ground, and no danger.

The tides hereabouts are very uncertain, depending much on the wind; and the tides from the Straits of Singapore and Drion meet here in some measure: they set strongest to the eastward and the southward, but generally longest to the N. W. sometimes 18 hours one way, and 6 hours the other. When at anchor in 22 fathom, Tree Island bearing S. E. by E. 2 miles, found the tide set $1\frac{1}{2}$ knot from N. W. to N. for 12 hours. Sometimes it would slack, and then run strong as before. It sometimes runs as long or longer to the S. E. and much stronger.

The south part of Barn Island bears from the north part of the Little Carimon E. $\frac{1}{4}$ N. distance $6\frac{1}{2}$ or 7 leagues. Barn Island is a pretty large and high woody island; on the west side whereof is a white mark, which at a distance much resembles a large barn, which, I imagine, gave it its name, and by which it may be easily known. There is good anchorage to the westward of Barn Island, from 9 to 14 fathom; and from $\frac{3}{4}$ to 1 mile off shore, the island bearing from N. E. to S. E. you have a good birth, with the outermost of the 2 islands Rabbet and Coney bearing east, southerly, and the extremes of Barn Island from E. N. E. $\frac{1}{4}$ N. to N. by E. about $\frac{3}{4}$ of a mile off shore.

Tree or Sandy Island is a narrow island or sand, lying E. S. E. and W. N. W. about 2 miles in length. At low water this island is dry; but at high-water it is almost entirely covered, there being little else to be seen but a large remarkable tree, which is nearest the east part of it: there are 5 or 6 other small trees and shrubs, and a small rock, which is all that is to be seen at high-water. The N. W. side of this island is broken ground, and from the west end of it there runs out a long ledge of rocks, part of which are dry at low-water. Come no nearer this part of it than 17 fathom. The ebb-tide sets over these rocks: the tree on this island bears from the north peak of Great Carimon E. $\frac{3}{4}$ N. and from the south part of Barn Island W. by S.

To the E. S. E. from Tree or Sandy Island, is a small island, called Red Island from the redness of the sand on its beach. This island is covered with pretty high trees, and may be seen a good distance. To the eastward and southward of this are a great number of other islands. It bears from the south part of Barn Island S. by W. about 4 miles.

The Rabbet and Coney are 2 small rocks, or islands, which are steep to, and lie S. by W. $\frac{1}{4}$ W. from the south part of Barn Island; distance about half a mile: when they are in one, they bear N. by E. $\frac{1}{2}$ E. and S. by W. $\frac{1}{2}$ W. You have 22 or 20 fathom within $\frac{1}{4}$ of a mile of these rocks; and 1 or $1\frac{1}{2}$ mile to the eastward of them you have irregular soundings from 19 to 30 fathom, rocky ground; and from these rocks to Barn Island you have from

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from 22 to 14 fathom, to the westward of Barn Island, where you may anchor in clear ground, from $9\frac{1}{2}$ to 12 or 14 fathom, on a bank about $\frac{1}{2}$ or $\frac{3}{4}$ of a mile off shore; between which and Barn Island you have 18, 19, and 20 fathom, gravelly ground.

To clear Tree Island. Being mid-channel, between Tanjan-boulus and the Little Carimon, in soundings from 17 to 20 fathom, ouzey ground, steer to the south-eastward till you bring the north point of the Little Carimon to bear W. $\frac{1}{4}$ S. or W. $\frac{1}{2}$ S. then steer to the eastward with these bearings, and you will have from 18 to 20 fathom; and as you go to the eastward, you will bring the north high peak of Great Carimon on with the south point of the Little Carimon, which will then bear W. by S. $\frac{1}{4}$ S. and the north point of the Little Carimon will bear W. $\frac{1}{4}$ S. These are good leading marks to go clear of Tree or Sandy Island, about 2 miles to the northward thereof. Endeavour to get sight of Tree Island as soon as possible, seeing it lies in the Fair-way, and is a good mark for the Straits of Sincapore; but you must be very careful of the setting of the tides hereabouts, they being very uncertain; and also to avoid the northern shore, lest, being becalmed, or having a southerly wind, and being out of the true tides, you be set into the old channel or straits, from whence it would be difficult for a ship to get into the Fair-way again, on account of the constant indraught there is amongst these islands.

Soundings between the Tree and Barn Island. Still steering to the eastward, with either or both the above leading marks on, you will soon see Barn Island, with the white mark on it, bearing E. $\frac{1}{4}$ S. you may steer right for it with great safety. The soundings, mid-channel, between Tree Island and Barn Island, are from 24 to 30 and 33 fathom, which shoalens, on Tree Island side, to 15 or 16 fathom, (under which I would not advise you to go) and on Barn Island side to 10 or $9\frac{1}{2}$ fathom, about $\frac{3}{4}$ of a mile from the westernmost part thereof, where there is good anchorage, as above mentioned. From that depth, towards Barn Island, you deepen your water to 14, 18, 19, and 20 fathom; and towards the Rabbet and Coney the soundings are from 10 to 14, 16, 20, and 22 fathom. You may pass, if there be occasion, within $\frac{1}{4}$ of a mile of the Rabbet and Coney in 20 and 22 fathom, red gravel.

West entrance of the Straits of Sincapore. Between the Rabbet and Coney and Red Island, is the channel into the Straits of Sincapore. You may keep mid-channel; but it is best to keep nearest the Rabbet and Coney, which are bold to; whereas the south shore is foul and dangerous, with several sunken rocks, some of which are not seen but at low water, viz. the westernmost rocks, which lie S. E. by S. 4 or 5 miles from Barn Island: these are covered at high, but dry at low water. You have 30 fathom about a mile to the northward of them, and I have sounded 20 fathom close to them. There is not more of them dry at low-water than the bigness of a ship's long-boat. The next is a single black rock, about the size of a ship's long-boat, and is always to be seen: it lies about $\frac{1}{3}$ of the channel over from the islands on the south side, and is steep to, having 17 or 18 fathom close to it, and 30 fathom a little without it: this bears from the former danger about east, and from Barn Island E. by S. 6 or 7 miles, and from St. John's Island S. W. $\frac{1}{4}$ S. $2\frac{1}{2}$ or 3 miles. The third is a ledge of rocks always above water, and a shoal without it, which lie E. by N. 6 or 7 miles from the second rock, and S. E. $\frac{1}{4}$ S. from St. John's Island; but the shoal lies S. E. by S. from St. John's; between which and the rocks you have from 15 to 18, 20, 30, 40 and 50 fathom water, and then shoalen again suddenly to southward.

St. John's I. St. John's is a pretty large and high island, covered with trees, and has 2 small islands to the westward, pretty near it. This is the easternmost island, as Barn Island is the westernmost, on the north side of this narrow passage; and they bear of each other E. by N. and W. by S. about 4 leagues; and, in case you want wind or tide to pass through before night,

night, there is good anchorage under St. John's Island from 12 to 14 fathom, the island ^{Anchorage.} bearing from W. S. W. to S. W. by W. about 2 miles distance, where, and on most of the island, you have plenty of water, or you may anchor to the westward of Barn Island, as mentioned in p. 75. You may likewise, upon occasion, anchor between St. John's and Barn Island in 18 or 19 fathom, though it is best not to anchor here if it can be avoided; for the bottom is rather foul, and the soundings irregular.

The tides run very strong between St. John's and Barn Island, and set as the islands ^{Tides.} lie; the flood E. by N. and the ebb W. by S. The time of their flowing is uncertain: they run longest to the eastward in the S. W. monsoon; and longest to the westward in the N. E. monsoon.

Being a-breast the Rabbet and Coney, your course to St. John's Island is E. by N. or ^{Going thro'} E. N. E. according as you have the wind: the distance is about 4 leagues: the soundings ^{the Straits of} are very irregular, from 30, 25, 20, and 18 fathom, hard ground; shoalening 5, 6, or ^{Singapore.} 8, and sometimes 10 or 12 fathom at a cast. In this track you should borrow on St. John's Island, in order to avoid the dangers, before mentioned, on the south shore. You may go within a mile or less of St. John's Island clear of all danger, it being bold to: within $\frac{1}{4}$ of a mile of it you have 20 and 24 fathom. Off the south part of St. John's Island it deepens towards the south shore to 30, 40, and 50 fathom, and then shoalens suddenly.

From St. John's Island Point Romania lies E. by N. $\frac{1}{2}$ N. distance 13 leagues; and ^{From St.} Pedro Branco E. by N. 15 or 16 leagues. Between these places is a wide and clear ^{John's to} channel, especially on the north side, except a sand which stretches out S. E. from the ^{Pedro} east end of Singapore Island, about 6 or 7 miles, and is steep to, having from 12 to 14 ^{Branco.} fathom just without it: its bearings are, St. John's Island W. S. W. 6 leagues; the E. point ^{Dangerous} of Singapore N. W. by N. $2\frac{1}{2}$ leagues; Johore Hill N. E. and the easternmost land to ^{shoal.} be seen off Point Romania E. $\frac{1}{2}$ N. 6 leagues. Come not under 18 or 20 fathom water, nor nearer the north shore than 3 leagues, till you are past the said bank; taking care to keep St. John's Island W. by S. and Point Romania E. by N. When you are past this shoal you may keep in with the north shore, the coast being clear and steep, in soundings of 15 or 16 fathom, ouzey ground; or in the Fair-way from 20 to 25 or 30 fathom, steer directly for Pedro Branco, a low white rock, at the S. E. entrance of the straits, to the northward of which you must pass; for to the southward thereof is a continued ledge of rocks, above and under water, to the south shore, or Island of Bintang. Barbucet Hill, and the southernmost island off Point Romania, when in one, bear W. N. W. Pedro Branco lies from the outermost rock or island off Point Romania E. by S. $\frac{1}{2}$ S. about $2\frac{1}{2}$ leagues, which is the breadth of the channel. Mid-channel the soundings are 25 fathom; near the reef off Point Romania, 18 or 20 fathom; and near Pedro Branco, 30 fathom: but to the eastward of Pedro Branco it shoalens again to 20, 15, and 12 fathom. Pedro Branco bearing W. by S. 3 leagues, you have $12\frac{1}{2}$ fathom, sandy ground; but near the reef off Point Romania you have hard ground and uneven soundings, from 17 to 12 fathom. The latitude of Point Romania 1 deg. 23 min. N. The variation, by several observations, 32 min. W. The longitude from London 103 deg. 15 min. E.

The shoal or reef that lies off Point Romania is larger and more dangerous than gene- ^{The reef off} rally imagined. We went through these straits in the night, by moon-shine, with the ^{Point Ro-} wind at S. E. and dragged along the south side of the reef in 20, 19, 18, 22, 20, and ^{mania.} next cast had 17 fathom. I could see by our altering the land, that we had a very strong tide setting to the eastward; and, by our shoalening the water, imagined we were coming near the S. E. part of the reef; whereupon I anchored in 17 fathom, and lay till day-light. When the ship was brought up, tried the current, and found it set N. E. by N. 4 knots: at day-light had these bearings; the outermost island off Point Romania

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from 22 to 14 fathom, to the westward of Barn Island, where you may anchor in clear ground, from $9\frac{1}{2}$ to 12 or 14 fathom, on a bank about $\frac{1}{2}$ or $\frac{3}{4}$ of a mile off shore; between which and Barn Island you have 18, 19, and 20 fathom, gravelly ground.

To clear Tree Island. Being mid-channel, between Tanjan-boulus and the Little Carimon, in soundings from 17 to 20 fathom, ouzey ground, steer to the south-eastward till you bring the north point of the Little Carimon to bear W. $\frac{3}{4}$ S. or W. $\frac{1}{2}$ S. then steer to the eastward with these bearings, and you will have from 18 to 20 fathom; and as you go to the eastward, you will bring the north high peak of Great Carimon on with the south point of the Little Carimon, which will then bear W. by S. $\frac{1}{2}$ S. and the north point of the Little Carimon will bear W. $\frac{1}{2}$ S. These are good leading marks to go clear of Tree or Sandy Island, about 2 miles to the northward thereof. Endeavour to get sight of Tree Island as soon as possible, seeing it lies in the Fair-way, and is a good mark for the Straits of Sincapore; but you must be very careful of the setting of the tides hereabouts, they being very uncertain; and also to avoid the northern shore, lest, being becalmed, or having a southerly wind, and being out of the true tides, you be set into the old channel or straits, from whence it would be difficult for a ship to get into the Fair-way again, on account of the constant indraught there is amongst these islands.

Soundings between the Tree and Barn Island. Still steering to the eastward, with either or both the above leading marks on, you will soon see Barn Island, with the white mark on it, bearing E. $\frac{1}{2}$ S. you may steer right for it with great safety. The soundings, mid-channel, between Tree Island and Barn Island, are from 24 to 30 and 33 fathom, which shoalens, on Tree Island side, to 15 or 16 fathom, (under which I would not advise you to go) and on Barn Island side to 10 or $9\frac{1}{2}$ fathom, about $\frac{3}{4}$ of a mile from the westernmost part thereof, where there is good anchorage, as above mentioned. From that depth, towards Barn Island, you deepen your water to 14, 18, 19, and 20 fathom; and towards the Rabbet and Coney the soundings are from 10 to 14, 16, 20, and 22 fathom. You may pass, if there be occasion, within $\frac{1}{4}$ of a mile of the Rabbet and Coney in 20 and 22 fathom, red gravel.

West entrance of the Straits of Sincapore. Between the Rabbet and Coney and Red Island, is the channel into the Straits of Sincapore. You may keep mid-channel; but it is best to keep nearest the Rabbet and Coney, which are bold to; whereas the south shore is foul and dangerous, with several sunken rocks, some of which are not seen but at low water, viz. the westernmost rocks, which lie S. E. by S. 4 or 5 miles from Barn Island: these are covered at high, but dry at low water. You have 30 fathom about a mile to the northward of them, and I have sounded 20 fathom close to them. There is not more of them dry at low-water than the bigness of a ship's long-boat. The next is a single black rock, about the size of a ship's long-boat, and is always to be seen: it lies about $\frac{1}{3}$ of the channel over from the islands on the south side, and is steep to, having 17 or 18 fathom close to it, and 30 fathom a little without it: this bears from the former danger about east, and from Barn Island E. by S. 6 or 7 miles, and from St. John's Island S. W. $\frac{1}{2}$ S. $2\frac{1}{2}$ or 3 miles. The third is a ledge of rocks always above water, and a shoal without it, which lie E. by N. 6 or 7 miles from the second rock, and S. E. $\frac{1}{2}$ S. from St. John's Island; but the shoal lies S. E. by S. from St. John's; between which and the rocks you have from 15 to 18, 20, 30, 40 and 50 fathom water, and then shoalen again suddenly to southward.

St. John's I. St. John's is a pretty large and high island, covered with trees, and has 2 small islands to the westward, pretty near it. This is the easternmost island, as Barn Island is the westernmost, on the north side of this narrow passage; and they bear of each other E. by N. and W. by S. about 4 leagues; and, in case you want wind or tide to pass through before night,

night, there is good anchorage under St. John's Island from 12 to 14 fathom, the island bearing from W. S. W. to S. W. by W. about 2 miles distance, where, and on most of the island, you have plenty of water, or you may anchor to the westward of Barn Island, as mentioned in p. 75. You may likewise, upon occasion, anchor between St. John's and Barn Island in 18 or 19 fathom, though it is best not to anchor here if it can be avoided; for the bottom is rather foul, and the soundings irregular.

The tides run very strong between St. John's and Barn Island, and set as the islands lie; the flood E. by N. and the ebb W. by S. The time of their flowing is uncertain: they run longest to the eastward in the S. W. monsoon; and longest to the westward in the N. E. monsoon.

Being a-breast the Rabbet and Coney, your course to St. John's Island is E. by N. or E. N. E. according as you have the wind: the distance is about 4 leagues: the soundings are very irregular, from 30, 25, 20, and 18 fathom, hard ground; shoalening 5, 6, or 8, and sometimes 10 or 12 fathom at a cast. In this track you should borrow on St. John's Island, in order to avoid the dangers, before mentioned, on the south shore. You may go within a mile or less of St. John's Island clear of all danger, it being bold to: within $\frac{1}{4}$ of a mile of it you have 20 and 24 fathom. Off the south part of St. John's Island it deepens towards the south shore to 30, 40, and 50 fathom, and then shoalens suddenly.

From St. John's Island Point Romania lies E. by N. $\frac{1}{2}$ N. distance 13 leagues; and From St. Pedro Branco E. by N. 15 or 16 leagues. Between these places is a wide and clear channel, especially on the north side, except a sand which stretches out S. E. from the east end of Singapore Island, about 6 or 7 miles, and is steep to, having from 12 to 14 fathom just without it: its bearings are, St. John's Island W. S. W. 6 leagues; the E. point of Singapore N. W. by N. $2\frac{1}{2}$ leagues; Johore Hill N. E. and the easternmost land to be seen off Point Romania E. $\frac{1}{2}$ N. 6 leagues. Come not under 18 or 20 fathom water, nor nearer the north shore than 3 leagues, till you are past the said bank; taking care to keep St. John's Island W. by S. and Point Romania E. by N. When you are past this shoal you may keep in with the north shore, the coast being clear and steep, in soundings of 15 or 16 fathom, ouzey ground; or in the Fair-way from 20 to 25 or 30 fathom, steer directly for Pedro Branco, a low white rock, at the S. E. entrance of the straits, to the northward of which you must pass; for to the southward thereof is a continued ledge of rocks, above and under water, to the south shore, or Island of Bintang. Barbucet Hill, and the southernmost island off Point Romania, when in one, bear W. N. W. Pedro Branco lies from the outermost rock or island off Point Romania E. by S. $\frac{1}{2}$ S. about $2\frac{1}{2}$ leagues, which is the breadth of the channel. Mid-channel the soundings are 25 fathom; near the reef off Point Romania, 18 or 20 fathom; and near Pedro Branco, 30 fathom: but to the eastward of Pedro Branco it shoalens again to 20, 15, and 12 fathom. Pedro Branco bearing W. by S. 3 leagues, you have $12\frac{1}{2}$ fathom, sandy ground; but near the reef off Point Romania you have hard ground and uneven soundings, from 17 to 12 fathom. The latitude of Point Romania 1 deg. 23 min. N. The variation, by several observations, 32 min. W. The longitude from London 103 deg. 15 min. E.

The shoal or reef that lies off Point Romania is larger and more dangerous than generally imagined. We went through these straits in the night, by moon-shine, with the wind at S. E. and dragged along the south side of the reef in 20, 19, 18, 22, 20, and next cast had 17 fathom. I could see by our altering the land, that we had a very strong tide setting to the eastward; and, by our shoalening the water, imagined we were coming near the S. E. part of the reef; whereupon I anchored in 17 fathom, and lay till day-light. When the ship was brought up, tried the current, and found it set N. E. by N. 4 knots: at day-light had these bearings; the outermost island off Point Romania

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W. S. W. $3\frac{1}{2}$ leagues, and Pedro Branco S. S. E. His Majesty's ship Panther made the signal of distress, being amongst the shoals: she bore of us N. N. E. about a mile distance. She was in 4 fathom, and had only $3\frac{1}{2}$ all round her, except the place she got out at, and there but bare 4 fathom. At 6 A. M. we weighed, being slack tide, or low water, and steered E. $\frac{1}{2}$ N. 3 miles, in 17, $16\frac{1}{2}$, 17, and 18 fathom, then steered N. E. by N. 2 miles, and had from 18 to 24 fathom, when Bintang Hill bore S. $\frac{1}{2}$ E. Barbucet Hill W. $\frac{1}{2}$ N. Pedro Branco S. by W. westerly; and the outermost island off Point Romania W. by S. $\frac{3}{4}$ S. about 4 leagues. I would not advise a ship, going through these straits to the eastward, with the wind S. or S. E. to come nearer the south side of this reef than 20 fathom; for it shoalens very suddenly from 17 to 12, 8, 5, and 4 fathom, with overfalls of 4 or 5 fathom at a cast: and be careful to observe the ebb tide which sets right over the reef very strong; for the tide would very soon have set us near to where the Panther was, had we not anchored as we did. Pedro Branco bearing S. W. by S. about 4 leagues, you are clear of the reef; and, for a long and safe leading mark, keep Bintang Hill S. by W. $\frac{1}{2}$ W. which will lead you clear of the reef, in no less than 15 or 16 fathom. By sheering to the north-eastward the water deepens fast to 20 and 25 fathom.

Pedro Branco, Bintang, &c.

Pedro Branco, by a very good observation, lies in lat. 1 deg. 20 min. N. and bears from Bintang Hill N. by W. about 5 leagues. From Pedro Branco to the outermost part of the reef the course is N. E. by N. 4 leagues; and when Bintang Hill bears S. by W. $\frac{1}{2}$ W. 6 or 7 leagues, in 15 or 16 fathom, ouzey ground, you are without the point of the reef, and may then steer N. N. E. or N. by E. for Pulo Auore, or rather Auore, or Aor; the water deepening fast to 20, 24, and 25 fathom. Bintang and Barbucet Hills bear of each other N. W. by N. and S. E. by S. 10 or 12 leagues.

Tides.

In the N. E. monsoon the flood runs strong into the straits, through the narrow passage between the Romania Rocks and Pedro Branco, (S. W. without, and W. S. W. in the narrow passage) frequently for 12 hours together, and sometimes longer, when it blows fresh; but in the S. W. monsoon the ebb tide runs longest to the E. N. E. and N. E. over the reef, at the rate of 4 knots. The time of high-water, at full and change, is uncertain, only in the S. W. monsoon it flows nearest north or south, or 12 hours; but in the N. E. monsoons it has great dependence on the winds.

From Pedro Branco to Pulo Auore.

Pulo Auore lies from Pedro Branco N. by E. 24 or 25 leagues, and from Bintang Hill N. $\frac{3}{4}$ E. 30 leagues; and after you have passed the reef off Point Romania, there is no danger, only a sunken rock, that lies south from Pulo Auore 7 or 8 leagues, which you will take care to avoid. You have soundings between the point of the reef off Romania and Pulo Auore, from 16 or 18 to 25 and 30 fathom; and when Pulo Auore bears from W. $\frac{1}{2}$ N. to W. $\frac{1}{2}$ S. 5 or 6 miles, you will have 35 fathom. I have often tried the current here in the S. W. monsoon, and found it constantly set N. and N. by E. $1\frac{1}{2}$ knot.

Pulo Auore.

Pulo Auore is high land, making in 2 hills like a saddle; the easternmost the highest: when they bear N. W. they are shut in one. The south part of this island lies in lat. 2 deg. 29 min. N. observed when lying at anchor there. Pulo Tingey, on which there is a very high peak, like unto a sugar-loaf, lies from Pulo Auore W. by S. $\frac{3}{4}$ S. distance 6 leagues; as does Pulo Pisang N. W. by N. 3 or 4 leagues. Pulo Auore bearing N. W. 11 or 12 leagues, you have 36 fathom, ouze; N. W. $\frac{1}{2}$ W. 4 leagues, 34 fathom, ouze; W. N. W. 2 leagues, 34 fathom, mud; W. N. W. $\frac{1}{2}$ N. 5 miles, 34 fathom; W. $\frac{1}{2}$ N. 4 or 5 miles, 34 fathom, mud; W. S. W. $\frac{1}{2}$ S. 4 leagues, 36, ouze; W. S. W. 8 or 9 leagues, 38 fathom, clay; S. W. $\frac{1}{2}$ S. 6 or 7 leagues, 38 fathom, ouze; W. S. W. $\frac{1}{2}$ S. 6 or 7 leagues, 37 fathom, ouze; S. W. $\frac{1}{2}$ W. 8 leagues, 38 fathom, mud; and S. S. W. 13 or 14 leagues, 38 fathom, mud: in short, Pulo

Pulo Auore bearing from W. S. W. to W. N. W. distance from 4 to 6 or 7 miles, you have 34 fathom, mud; the same bearings, about 4 leagues distance you have 36 fathom, ouze; and at 6 or 7 leagues distance 37 fathom, ouze, mixed with sand and broken shells.

You sail to the eastward of these islands in soundings from 30 to 40 fathom. Pulo Timoan bearing W. by N. $\frac{1}{2}$ N. 6 leagues; Pulo Pisang W. S. W. 3 or 4 leagues, and Pulo Auore S. $\frac{1}{2}$ E. 4 leagues, you have 34 fathom, mud and clay. Pulo Timoan bearing W. N. W. $\frac{1}{2}$ W. 8 or 9 leagues; Pulo Auore W. by S. $\frac{1}{2}$ S. 6 or 7 leagues; and Pulo Pisang W. $\frac{1}{2}$ N. you have 36 fathom, green ouze, mixed with coarse sand and broken shells. Pulo Timoan W. by N. 12 or 13 leagues; Pulo Auore S. W. by W. $\frac{1}{2}$ W. 9 or 10 leagues; the Anambas Islands from mast-head E. S. E. 13 or 14 leagues, 37 fathom, ouze. Pulo Timoan W. 8 or 9 leagues, the Anambas seen at the mast-head from N. E. to E. N. E. 36 fathom, ouze, mixed with sand and broken shells; Pulo Timoan S. W. by W. 8 or 9 leagues, Pulo Pisang S. W. by S. and Pulo Auore S. S. W. 13 or 14 leagues, 38 fathom, mud.

From Pulo Auore to Pulo Timoan the course is N. N. W. $\frac{1}{2}$ W. distance 9 leagues. Pulo Timoan. The depth of water between them, from 36 to 30 fathom. Pulo Timoan, the northern-most of these islands, is a large and high mountainous island, covered with trees, and lies in lat. 2 deg. 50 min. N. and long. 109 deg. E. from the Lizard. There is no variation at this island. I purpose giving a further account of Pulo Auore and Pulo Timoan in my Remarks from Manilla through the Straits of Sincapore and Malacca.

From Pulo Timoan to Pulo Condore the course is N. 19 deg. E. 122 leagues. You have soundings all the way between these islands; particularly, Pulo Timoan W. by S. 5 leagues, you have 35 fathom, and S. by W. $\frac{1}{4}$ W. 15 or 16 leagues, 40 fathom, ouzey ground; in lat. 4 deg. 2 min. N. and meridian distance 23 min. E. from Pulo Timoan, 42 fathom, sand and ouze; from thence to lat. 5 deg. 24 min. N. and meridian distance 49 min. E. from 42 to 40 fathom, sand, mud, and ouze; from thence to lat. 6 deg. 49 min. N. meridian distance 1 deg. 18 min. E. from 40 to 38, 35, 30, and 27 fathom, mostly sand, sometimes with ouze; from thence to lat. 7 deg. 30 min. N. meridian distance 1 deg. 35 min. E. from 27 to 25 and 22 fathom, sand; from thence to lat. 8 deg. 18 min. N. meridian distance 2 deg. 18 min. E. from 21 to 19 and 21 fathom, coarse brown sand: when Pulo Condore bore from N. by W. to N. by E. $\frac{1}{2}$ E. 8 or 9 leagues, had 19 fathom; and at noon, when the body of it bore N. W. $\frac{1}{4}$ W. 7 or 8 leagues, had 21 fathom. The variation is little or none, nor did we find any current worth speaking of.

Pulo Domar lies due east from Pulo Pisang in lat. 2 deg. 43 min. N. and is about the height of a large ship's main-top out of the water, and about 3 times as big as a large ship's hull: the sides of it appear to be steep, or rather perpendicular, and look very white when the sun shines upon it. This island lies in the Fair-way between Pulo Pisang or Pulo Auore, and the Anambas, but nearest the latter; and, to all appearance, bold to, and no danger near it. Pulo Domar bearing N. E. Pulo Pisang W. $\frac{1}{2}$ N. Pulo Timoan N. W. and Pulo Auore W. by S. $\frac{1}{2}$ S. distance about 10 leagues, you have 38 fathom, ouze.

The Anambas are a cluster of small islands, some of which are pretty high, and may be seen 9, 10, or 11 leagues: the body of them lie about due east from Pulo Auore, distance about 21 or 22 leagues. One of the Anambas in sight, from the deck, bearing E. by S. $\frac{1}{2}$ S. 10 or 11 leagues, you have 40 fathom, ouze, mixed with sand and broken shells.

The soundings between the Anambas and Pulo Auore are very regular, and the sort of soundings so much alike, that I cannot say how a man may direct himself by them, only in regard to the depth; for the ground is generally ouzey, as you may see by the above particulars off Pulo Auore, &c. Mid-channel, between Pulo Auore and the Anambas, Soundings between the Anambas and Pulo Auore.

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Anambas, i. e. about 10 or 11 leagues; to the eastward of Pulo Auore you have 38 fathom, ouze. If you are nearer the Anambas than Pulo Auore, you will have 40 fathom, ouze; when you may see the Anambas in clear weather. If you can keep in 35, 36, or 37 fathom, you will be in the Fair-way, and pass 4, 5, or 6 leagues to the eastward of Pulo Auore.

Natunas.

The Natunas are a cluster of small islands to the north-eastward of the Anambas, and not far from them: some of them are pretty high, and may be seen 9 or 10 leagues. The northernmost of them lie in about 4 deg. N.

In the months that the monsoons shift in, the currents run very strong among the Islands Timdan, Pisang, and Auore, and between them and the Anambas, and are very changeable, setting, at the latter end of September, or beginning of October, for several hours together, to the S. S. W. and S. W. by S. $1\frac{1}{2}$ or 2 knots per hour, and, after ceasing for some time, will set to the southward, at the rate of 1 knot, and then S. S. E. S. E. and E. S. E. and sometimes to the N. E. $1\frac{1}{2}$ knot, for several hours together, and then cease again for some time, and set to the S. and S. S. W. as before. In the month of April, when the monsoons shift again, the currents run as fast to the northward, from N. by W. to N. N. E. and N. E. at the rate of 1 or $1\frac{1}{2}$ knot, and sometimes 2 knots. So those who come this way in the aforesaid months, and in hazey weather, or the night-time, must have great regard to the currents, or they will be much deceived. In the other months, after the monsoon is set in, the currents are pretty regular and constant, in both monsoons. In the S. W. monsoon the current, from Pedro Branco to Pulo Auore, &c. sets N. by E. or N. N. E. about 1 knot. At Pulo Auore, and between it and the Anambas, the current sets N. and N. by E. $1\frac{1}{2}$ knot; and so to the north part of Pulo Timoan. And from Timoan, for 20 leagues to the northward of it, you will have a current setting N. by E. about 1 knot; and then the current ceases; and you find little or no current afterwards as you sail to Pulo Condore, Pulo Sapata, or, indeed, all over the China Seas, in either monsoon, except at the time of their shifting. In the N. E. monsoon the currents set just the contrary way, at much the same rate.

Being the length of Pulo Auore, or Pulo Timoan, there is a necessity of making Pulo Condore, for the greater certainty of making Pulo Sapata, and to avoid the Middleburgh Shoal.

Pu'o Condore.

Pulo Condore is a high and mountainous island, or rather number of islands, of which Condore is the largest and highest, and the only one, it is said, that is inhabited. These islands lie about east and west, 14 or 15 miles in length, and appear at a distance in a number of hummocks; but as you approach nearer, these hummocks soon appear to be a number of very high hills or mounts. This island may be seen in clear weather 16 or 17 leagues. I have seen it bearing N. by E. $\frac{1}{2}$ E. 14 leagues, in 20 fathom water.

Remarks to prove the English Pilot and New Directory erroneous in the longitude of Pulo Condore.

Here I must observe, that the situation of Pulo Condore, in respect to longitude, is very erroneous, by all the English books and charts, and also by the New Directory, which, in respect of the island's longitude, is as false as the rest. The English Pilot makes this island in lat. 8 deg. 43 min. N. and long. 112 deg. 30 min. E. from the Lizard, which is 107 deg. 16 min. E. from London; and the New Directory allows its lat. 8 deg. 40 min. N. and long. 105 deg. E. from Paris, (for which he quotes the authority of Father Gaubil, who made the observations) i. e. 107 deg. 35 min. E. from London, which is still further to the eastward than the English Pilot makes it. Now, suppose Pulo Timoan to be right as laid down in the English Pilot, in lat. 2 deg. 50 min. N. and long. 109 deg. E. from the Lizard, and Pulo Condore as above, the difference of lat. will be 5 deg. 53 min. the departure 3 deg. 30 min. and the course from Timoan to Condore N. N. E. $\frac{3}{4}$ E. distance 138 leagues; which is one point to the eastward more than the course really is, and makes the distance 16 leagues more than it ought

to

to be; which is a great and dangerous error: and by the longitude in the New Directory the error is still greater; for it lays Pulo Condore in 107 deg. 35 min. from London, which is 112 deg. 49 min. from the Lizard; and lat. 8 deg. 40 min. N. which gives 5 deg. 50 min. difference of latitude; and 3 deg. 49 min. meridian distance, or departure from Timoan to Condore; which gives the course N. 33 deg. E. distance 140 leagues; which makes the course $1\frac{1}{4}$ point to the eastward more than it is, and the distance 18 leagues more than it should be.

I shall now give my own opinion in respect to the situation of Pulo Condore, with my own observations of the course and distance from Timoan to Condore, and also its true latitude and longitude. I have discoursed many experienced navigators on this head, who assured me, that they had made the same observation that I had done; which is, all the directories, or books of directions, of these parts, are erroneous in respect to the course and distance from Timoan to Condore, and that Condore is laid down 1 deg. 30 min. too far to the eastward. I shall now assure you, that instead of 3 deg. 30 min. meridian distance between Timoan and Condore, which the English Pilot makes, or 3 deg. 49 min. which the author of the New Directory makes, between these islands, there is but 2 deg. 3 min. meridian distance between them; which error, as well as that of their course and distance, may be attended with very dangerous consequences, as Pulo Condore is a place where the generality of ships take their departure from, when bound into the Chinese Seas, or coming out of them. Know then, that the true course from Pulo Timoan to Pulo Condore, by my own experience and certain knowledge, is N. 19 deg. E. or N. by E. $\frac{3}{4}$ E. distance 122 leagues; which gives no more than 2 deg. meridian distance, or difference of longitude, between them. This I am well assured of; and the true latitude and longitude of Pulo Condore is as follows: lat. 8 deg. 40 min. N. and long. from the Lizard, 111 deg. 3 min. E. I made the variation, by several observations off this island, in September, 1762, 16 min. W.

Pulo Condore bearing N. by E. $\frac{1}{2}$ E. distance 16 or 17 leagues, (at which bearings and distance it may be seen in clear weather) you will have 20 fathom, fine white sand, with black specks; N. N. E. 9 or 10 leagues, 20 fathom, fine sand and small stones; N. N. E. 7 or 8 leagues, 19 $\frac{1}{2}$ fathom, fine white sand; N. by E. 4 or 5 leagues, 19 fathom, ditto; N. W. 7 or 8 leagues, 21 fathom, ditto; W. 10 leagues, 22 fathom, ditto; W. 12 leagues, 24 fathom, ditto; W. by S. $\frac{1}{2}$ S. 22 leagues, 28 to 30 fathom, fine grey sand; W. by S. $\frac{1}{2}$ S. 25 or 26 leagues, 37 fathom, fine dark-coloured sand; W. by S. $\frac{1}{2}$ S. 30 or 31 leagues, 42 fathom, ditto; and W. by S. or W. by S. $\frac{1}{2}$ S. 40, 41, or 42 leagues, 48 or 50 fathom, fine grey sand; and you will have no soundings to the eastward of this.

Being to the eastward of Pulo Condore, in lat. 8 deg. 40 min. N. and in 20 fathom water, you will be sure to see it bearing W. 6 or 7 leagues, unless the weather is very hazey. You may depend upon seeing it, in clear weather, from the following soundings: in 22 fathom you may see it bearing W. 10 leagues; in 24 fathom, W. 12 leagues. I have set it at this distance and depth of water, and saw it very plain. If you are sure of your latitude and soundings, you may depend on the distance above mentioned, should the weather prove so hazey that you cannot see it.

Being 7 or 8 leagues off Pulo Condore, in 20 fathom; or 9 or 10 leagues from it, in 22 fathom; and you intend to see Pulo Sapata, you must steer N. E. $\frac{1}{2}$ E. which will carry you far enough without it; or N. E. by E. which will carry you but just in sight of it, in clear weather. You have soundings all the way between them. Pulo Condore bearing N. W. 7 or 8 leagues, we had 21 fathom, fine white sand, with some black specks; from whence steered N. E. $\frac{3}{4}$ E. 84 miles, whereby we deepened our water gradually from 21 to 28, 32, 36, and 42 fathom, grey sand and shells; from thence steered

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N. E. $\frac{1}{4}$ E. 31 miles, and deepened our water to 47 and 55 fathom, coarse grey sand, and to 72 fathom, clay and sand; continuing the same course, soon after had no ground, 90 fathom, when hauled in to the northward 10 miles, and had soundings, 72 fathom, coarse grey sand; steered north 5 miles, and had 52 fathom. Pulo Sapata bearing N. E. $\frac{1}{4}$ E. 8 or 9 leagues, had 42 fathom, coarse grey sand, with some small stones and black specks, like pepper corns; Pulo Sapata N. E. by E. 10 leagues, and the Westernmost Catwick N. N. E. $\frac{1}{4}$ E. 7 or 8 leagues, had 52 fathom, fine brown sand; Pulo Sapata E. N. E. 8 leagues, and the Westernmost Catwick N. E. 6 leagues, 46 fathom, fine grey sand; Pulo Sapata N. E. 9 leagues, 96 fathom, mud and sand; N. N. E. 8 or 9 leagues, 78 fathom, ouze: here we found the current set S. S. W. 2 knots and 3 fathom, the latter end of September. Pulo Sapata N. by E. $\frac{1}{4}$ E. 9 leagues, 72 fathom, ouze; N. by E. $\frac{1}{4}$ E. 5 leagues, 70 fathom, ouze and white sand; N. by E. $\frac{1}{4}$ E. 7 miles, 75 fathom, ouze; N. by E. 4 leagues, 80 fathom, ouze; N. by E. 7 or 8 leagues, 85 fathom, mud and sand; N. E. $\frac{1}{4}$ E. 7 leagues, and the Westernmost Catwick N. by E. $\frac{1}{4}$ E. 8 leagues, 62 fathom, ouze and sand; the Westernmost Catwick N. N. E. 7 or 8 leagues, 71 fathom, ouze and sand. By which it appears, that there are regular soundings all the way between Pulo Condore and Pulo Sapata; that the water deepens fast as you come near Sapata; and that the bank goes off suddenly from 85 to 90 fathom, and no soundings. When Sapata bears about N. by E. you are then going off the bank: at that bearing, 7 or 8 leagues, you have 85 fathom, which is the edge of the bank, as a very little to the eastward or southward thereof you have no soundings; which shews that there are no soundings to the eastward of Sapata, and that there is deep water very near it. In or near the latitude of Pulo Sapata, if you have under 48 fathom, you are to the westward of it; if you have 52 fathom in the stream of Sapata, in the Fair-way between it and Condore, it will bear from E. N. E. to N. E. by E. 10 leagues; if you have from 70 to 85 fathom, you are to the southward of Sapata, and near the edge of the bank, and Sapata bears from N. by E. to N. N. E. from 4 to 8 leagues: therefore, being in the latitude of Sapata, and no soundings, you may be sure you are to the eastward of it.

Pulo Sapata.

Pulo Sapata lies in lat. 9 deg. 54 min. N. and longitude, by computation, 113 deg. 9 min. E. from the Lizard; 107 deg. 55 min. E. from London; and 2 deg. 6 min. E. from Pulo Condore; bearing from the latter E. N. E. $\frac{1}{4}$ N. distance 48 leagues. This is a pretty high and rocky island, which may be seen in tolerable clear weather 9 or 10 leagues. Most ships, bound to China, endeavour to make this island; and also in their return from thence: I therefore have ascertained its latitude and longitude with as much exactness as possible. To the north-westward of this island, and some distance from it, lie 2 other islands, called the Catwicks: these also are pretty high, and may be seen 7 or 8 leagues in clear weather.

From Pulo
Sapata to
Cabra, or
Goat Island.

From Pulo Sapata, being bound to Manilla, shape your course about N. E. or so as to be sure to get into the latitude of 12 deg. $\frac{1}{4}$ N. before you make 4 deg. easting; for in lat. 11 deg. 30 min. N. and long. 4 deg. E. from Sapata, lie 2 dangerous shoals: these were seen on board his Majesty's ship South-Sea Castle on her passage from Pulo Sapata to Manilla, 1762, according to the following extract from the ship's log-book. "At day-light, "in the morning, saw 2 low sandy islands a-head, lying S. W. and N. E. of each other; "the distance between them 2 or 3 leagues. The northernmost bore N. N. W. and had a "high tree on it; the southernmost bore N. W. by W. distance 7 or 8 miles. Lat. in, "by account at that time, 11 deg. 30 min. N. and longitude, made from Pulo Sapata, "4 deg. E. Pulo Sapata, by estimation, S. 68 deg. W. distance 97 leagues: sounded, "no ground." Also, the same year, a country ship, named the Sabut Jung, from Bengal to Manilla, remarks that between Sapata and the Island Cabra, or Luban, is a low island, almost

almost in the Fair-way, which must be avoided by failing to the northward thereof: few or none lay it down in its true latitude, which is 11 deg. 28 min. N. and meridian distance, from Pulo Sapata, 5 deg. 12 min. E. It is so low that we did not see it, till within 3 miles of it, in clear weather. To the westward it appears clear, but to the eastward is a low sandy bank; and about 7 leagues to the eastward of the island is a shoal, on which we had only 8 fathom water. I imagine these were the same, as their latitude is so much alike; though there is 1 deg. 12 min. difference in their longitude. These remarks are worthy of notice. From lat. $12\frac{1}{2}$ deg. N. to 13 deg. 50 min. N. you may steer to the eastward with great safety, in order to make Cabra, or Goat Island.

It is to me something surprising, that none of the navigators who have frequented these seas, have taken any notice of Cabra or Goat Island, notwithstanding it is the place that all ships bound to Manilla endeavour to fall in with, and take their departure from, when they return; nor is the latitude or longitude of it so much as mentioned, which I think is highly necessary for navigators to be acquainted with, as they both begin and end their reckonings at the Island Cabra. I shall therefore give a description of that island, with its true latitude, by my own observation, and the longitude of it as near as can be ascertained by the most exact computation both of my own and others journals.

I must here take notice of the continued error of the English India Pilot, whose whole book of directions may, with great truth, be said to be one continued error: it is so false and erroneous, that it ought not to be suffered to be published, it being nothing more nor less than a deceiver of mankind, and will lead them from error to error throughout the whole book, which may be of dangerous consequence to those who may be weak enough to follow its directions, &c. I have already mentioned its great error in respect to the Islands Condore and Timoan; and shall now plainly shew that its error is much greater in respect to Condore and Manilla. It lays down Pulo Condore in lat. 8 deg. 43 min. N. and long. 112 deg. 30 min. E. from the Lizard; and Manilla in lat. 14 deg. 35 min. N. and long. 122 deg. 20 min. E. from the Lizard, which makes only 9 deg. 50 min. difference of longitude between them; whereas there is full 13 deg. between Condore and Goat Island, which is above 20 leagues to the westward of Manilla, as will be shewn hereafter.

Errors of the
English India
Pilot.

See the New Directory for the best directions; the author of which proves, by comparing a great number of the journals of ships that have sailed this track, that there is 13 deg. meridian distance between Pulo Condore and Goat Island. I made 13 deg. 20 min. E. longitude, when Goat Island bore E. N. E. 2 or 3 leagues; and I am informed, that most of the ships in our squadron made thereabouts; which proves the India Pilot in a very great error.

The Island Cabra, or Goat Island, is a low, flat, rocky island, seemingly steep to on all sides, which is about 9 or 10 miles in length, and near as much in breadth, being almost round; and may be seen from a ship's deck 6 or 7 leagues. The latitude of this island, by my own observation, is 13 deg. 56 min. N. and its longitude, by the most exact computation, 124 deg. 27 min. E. from the Lizard, or 119 deg. 13 min. E. from London. I have tried the variation, by several observations, off this island, 1762, and found none. When this island bears S. E. by E. it is then on with the Island Luban, which, being very high and mountainous, may be seen 17 or 18 leagues.

The Island
Cabra, or
Goat Island.

As you sail from Goat Island, towards the Island Mirabelle or Corigedore, you will see the Island Fortune, which is a small, but high, rocky island, bearing from Corigedore S. by W. $\frac{1}{2}$ W. 5 or 6 leagues. You leave this island on your starboard-side, and passing it about 3 leagues to the westward, you will have no soundings till you come within 2 or 2 $\frac{1}{2}$ leagues of Corigedore, whereabouts you have from 45 to 50 fathom, sandy ground; and keeping on towards Corigedore, you shoalen your water gradually to 40, 35, 30 fathom; and about 2 miles to the westward thereof you have 26 or 27 fathom. As you near Corigedore,

From Goat
Island to
Mirabelle.

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A Rock like a fail. Corigedore, you will see a rock like a fail, which lies about half way between it and the south shore, bearing from Corigedore S. E. by S. about $2\frac{1}{2}$ miles, and is steep to on all sides. You have 20 fathom within $\frac{1}{4}$ of a mile of this rock; and from 20 to 24 fathom between it and Corigedore; and between the rock and the south shore there is from 20 to 17 fathom, within $\frac{1}{4}$ of a mile of the shore, all clear, sandy ground, and no danger but what you see. There is also another, which I call the Haycock Rock, from its great resemblance thereunto, bearing from Corigedore W. $\frac{3}{4}$ S. about $2\frac{1}{2}$ miles: it is pretty high and steep to on all sides, having 27 fathom within $\frac{1}{4}$ of a mile all round it. Between this and the north shore you have regular soundings from 27 to 28, to 20 fathom, $\frac{1}{4}$ of a mile from the shore, fine, clear, sandy bottom; and between it and Corigedore, from 27 to 22, to 29 and 30 fathom; the nearer the N. W. part of Corigedore, the deeper the water.

Haycock. There is a rock with a hole in it, which you may see through, lies a very small distance off the N. W. or W. part of Corigedore, within a cable's length, whereof you have 30 fathom. A-breast of Corigedore, mid-channel between it and the north shore, you have 26 fathom; the nearer Corigedore, the deeper the water, deepening from 26 to 36, 48, and 52 fathom, within $\frac{1}{4}$ of a mile of the island; and on the other hand, it shoalens quickly from 26 fathom, mid-channel, to 16 or 15 fathom, within $\frac{1}{4}$ of a mile of the north shore, hard stoney ground. Being in 45 or 50 fathom, 2 leagues or thereabouts to the westward of Corigedore, steer directly for that island; and if you have a fair wind, the common passage is between the Haycock and Corigedore, and so between it and the north shore, keeping Corigedore on the starboard-side.

Rock with a hole in it. The Island Mirabelle, or Corigedore, is a pretty high and large island, near the entrance of Manilla Bay, but rather nearest the north shore, lying in lat. 14 deg. 24 min. N. and longitude from the Lizard 125 deg. 3 min. E. or 119 deg. 49 min. E. from London, and bears from Goat Island N. E. $\frac{1}{2}$ E. distance 15 leagues. There is plenty of good fresh water near the west part of this island, under a very high steep cliff, about $\frac{1}{4}$ of a mile from the rock with a hole in it; but it is bad landing on a stoney beach, though the water is always smooth.

Island Mirabelle or Corigedore. From Corigedore the course to Manilla is E. N. E. $\frac{1}{4}$ N. distance 11 leagues; and to Caveta E. by N. $\frac{1}{2}$ N. 8 or 9 leagues. In this passage you must be very careful of a dangerous shoal that lies in the Fair-way, called St. Nicholas's Shoal, which has but 11 feet on the shoalest part of it, and is steep to. I have with great pains carefully sounded this shoal, and ascertained its exact situation, viz. on the outer part of this shoal, the N. W. part of Corigedore bears W. 13 deg. S. Caveta Church E. 17 deg. N. and the extremes of the land about Caveta E. 23 deg. N. here there is but 11 feet water, and within a ship's length to the north-westward thereof you have 13 or 15 fathom, being so steep to, that no one can tell when he is near it by his soundings; therefore have a strict regard to the leading marks, viz. as you steer to the eastward from Corigedore for Manilla or Caveta, keep the N. or N. W. part of Corigedore W. S. W. till you bring Caveta church-steeple to bear E. and a remarkable hummock, close to the sea, on a point of land, on the north shore, W. N. W. $\frac{1}{2}$ N. you are then clear of St. Nicholas's Shoal, and may steer for Caveta or Manilla at your pleasure. You have soundings between Corigedore and the north shore, 26 fathom; between St. Nicholas's Shoal and the north shore, in the Fair-way, 17 and 18 fathom, (shoalening gradually towards the north shore to 5 and 4 fathom) and as you steer to the eastward, you will shoalen your water gradually from 17 to 14, 12, 10, 8, 6, and 5 fathom, in which depth you may anchor in safety off Caveta, the flag-staff S. $\frac{1}{2}$ W. a low point of land, called Shingley Point, and Corigedore in one, W. $\frac{3}{4}$ S. distance from Caveta a large mile, the bottom muddy, and good holding ground.

Soundings. Anchorage. Turning to windward. Being to the westward of the Island Corigedore, with the wind easterly, or E. N. E. which is

is right out of Manilla Bay, it is best to go through the south channel, between Corigedore and the south shore, there being more room for a ship to turn to windward, and no danger but what may be seen; the south shore being bold, and clear of all danger; as is Corigedore, the nearer to which you come, the deeper the water on all sides: but you must carefully observe the 2 following remarks. 1st, When you have got a-breast the easternmost high land on the south shore, which bears from Corigedore S. E. $\frac{1}{2}$ E. you must be careful how you stand towards the south shore; for the tail of St. Nicholas's Shoal trenches away gradually towards the above-mentioned high land; and you will sometimes shoalen your water suddenly from 12 to 6 or 7 fathom, hard, rocky ground; therefore I would advise you to stand into no less than 12 or 13 fathom, and as you get further to the eastward, not to stand into less than 15 or 16 fathom; for I have had 15 fathom one cast, and 7 or 6 $\frac{1}{2}$ the next, and then 4 fathom, which is on the edge of St. Nicholas's Shoal. 2d, To weather away the east part of Corigedore as soon as you can: you will have 22 or 23 fathom within half a mile of it. When you can weather it, stand over for the north shore, and keep working up along that shore, which is bold to, having in most places 15 or 16 fathom a quarter of a mile off shore, and 10 or 12 fathom at a cable's length, though it shoalens very suddenly from 15 to 10, 7, and 5 fathom in some places; nor is there any danger but may be seen. After you are past Corigedore, the north shore has a clear, sandy bottom, and good anchorage. As you go more to the eastward and northward, you will find the north shore more flat, and the soundings more gradual, having 17 or 18 fathom three quarters of a mile off shore, and 12 fathom half a mile off shore, shoalening gradually from 12 to 10, 8, 6, 5, 4, and 3 fathom, close in shore. As you stand to the southward, be careful to avoid the St. Nicholas's Shoal, according to the leading marks above given to carry you clear of it.

In Manilla Bay there is a tide, which ebbs and flows about 3 feet perpendicular; but I never could find the time of its flowing. It is not regular in the bay; and about Corigedore I have often seen it run strong to the westward for 24 hours together, especially with the wind easterly, then cease for 4, 5, or 6 hours, and then run strong to the westward again; and between Corigedore and the north shore I have observed the tides run out for 18 hours together to the westward, pretty strong, and then turn and run as strong to the eastward for 6 hours, in which time the water has flowed to its full height; but could not, with any exactness, determine the time of high water: but this is certain, that the tide runs to the westward 18 hours out of the 24, and sometimes the whole 24 hours; and there is no where in this bay but one tide in 24 hours, i. e. one flood and one ebb; and it flows as much in 6, as it ebbs in 18 hours. Tides.

Caveta is properly the sea-port to Manilla, though it is a town and garrison itself. It is situated on a low point of land, which forms a most safe and excellent harbour, though rather too shallow, having no more than 18 or 19 fathom in the deepest part of it, the bottom soft mud; but great ships may lie in safety in Caveta Road, where they are well sheltered from the S. W. and W. winds. Here the Spaniards have a very good marine yard, well stored with all kind of naval stores; build their galloons and other ships, and have excellent conveniences for heaving ships down and repairing them, at which the Spaniards are very dexterous. It is fortified both by sea and land: at the extreme point of it there is a square battery, with 10 guns in the faces to the N. and N. E. in order to defend the entrance of the harbour: it has also a citadel with 4 bastions, &c. which form pretty near a square, and is called Fort St. Philip: the marine yard extends from the extreme point to this port; and the town, from hence to the gates: it is defended towards the land by 2 round towers, with 10 pieces of cannon each, and a wall with a parapet from one to the other; in the middle whereof is the land gate, before which there is a wet ditch, formed by the sea, and a draw-bridge a-cross it: without this gate

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there is a narrow neck of land, (the narrowest part of which is not more than 32 yards over) for about $\frac{1}{2}$ a mile, which adds greatly to the strength of this place by land: it has likewise 2 other batteries to sea-ward, one of 14, and the other of 8 guns. There is no good water in Caveta, though there are a great number of wells with plenty of water; but it is all brackish: the Spaniards neither use it for drinking, nor dressing of victuals. They send for their water up the river, by Old Caveta, where they get very good water; but this river is not navigable even for boats, only at high water; and is commanded by the fortifications at Caveta.

From Caveta to Manilla.

Manilla lies from Caveta N. N. E. $\frac{1}{4}$ E. about 3 leagues, and no danger between them: the soundings are regular from 5 fathom, at Caveta, to 6, 7, 8, and 9 fathom, half way to Manilla, and then shoalen gradually to 8, 7, 6, 5, and $4\frac{1}{2}$, or 4 fathom off Manilla; and if you have occasion to turn between them, you may stand in shore any where between them, to 5, or $4\frac{1}{2}$ fathom, the shores being very flat, and shoalen very gradually every where; all clear ground, and muddy bottom. You lie in a good birth in Manilla Road, with the following bearings, viz. The fishing stakes at the river's mouth N. 18 deg. E. the north bastion N. $37\frac{1}{2}$ deg. E. the cupola E. 37 deg. N. the S. W. bastion E. 20 deg. N. in 5 fathom water, 1 mile from Manilla. The Spanish ships very seldom anchor off Manilla, but generally in Caveta Road or Harbour.

Manilla.

Manilla, the principal Spanish settlement, and seat of a superior governor-general over all the Philippine Islands, is a spacious city, situated on the Island Luconia, in lat. 14 deg. 39 min. N. and longitude, by astronomical observation, made there by the Spaniards, 120 deg. 19 min. E. from London, which agrees pretty exactly with my longitude of Goat Island, as determined by our run from Pulo Condore; and the variation of the compass, by several observations, I made 36 min. W. This city lies on the south side of the entrance of the Rio de Pasig, and is encompassed round with a good wall, fortified with bastions, &c. but the works, though regular on the S. and E. sides, are irregular on the N. and W. sides, as they follow the shape of the river and bay. The situation of Manilla and the safe port of Caveta make it a convenient place for trade; but, notwithstanding these advantages, there is not much trade carried on here, considering the largeness of the city, and number of its inhabitants. They have three galloons, which pass and repass annually between this place and Acapulco, bringing immense treasures from the latter, which is their chief dependence here. These sail from Acapulco in March or April, and arrive at Manilla in about August or September. They have also about 5 or 6 sail of other vessels, that trade to China and Batavia: and they have 4 sail of row-gallies, which are armed vessels to guard the coasts and islands adjacent. The air at Manilla is very unwholesome during the months of June, July, and August, being very close and humid, and subject to great vapours and fogs, occasioned by the vigorous vegetation from the low level swampy lands near to, and around the city, for several miles; whereby fevers and fluxes are very rife, and some years carry off great numbers of the inhabitants. The muskatoes also are very troublesome in these months.

Wooding & watering.

Wood is a very scarce article both here and at Caveta, there being none to be had but what is brought down the rivers from the inland parts in country boats. The river at Manilla is very good water: you go up it to the bridge, where you fill your casks in the boat; so that, if your ship is in Manilla Road, you may water with great expedition; but this river is entirely commanded by the garrison of Manilla.

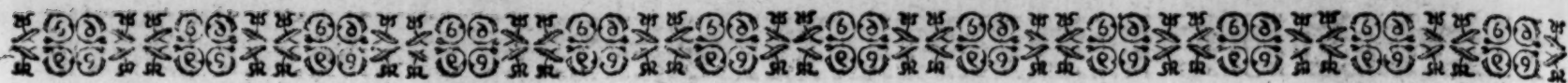
Some Remarks on the Monsoons in the Chinese Seas, and at the Philippine Islands, &c.

FROM the Straits of Sincapore, all over the Chinese Seas, to the Philippine Islands, the monsoons are much the same as on the Coast of Coromandel, &c. of which having already treated in p. 52, I shall now only take notice of those parts where the monsoons blow true, and where they are entirely lost, even in the height of the monsoons elsewhere.

The S. W. monsoon sets in about April, and continues to the beginning of October. The S. W. In June, July, and August, they have much rain, and sometimes fresh gales of wind, monsoon, in these seas. In September the winds are variable, sometimes from N. E. to E. and S. E. blowing fresh with rain, but in general from the S. W. quarter; and continue thus to the new or full moon in the beginning of October, when it generally breaks up in a violent storm from the S. W. Sometimes the storm comes on at W. or N. W. with abundance of rain: when the storm ceases, the wind shifts gradually round to the N. and N. E. or E. N. E. in which quarter it continues all the N. E. monsoon. The whole month of October is rather dangerous, and they have generally some rain; but after that, the weather is fair and settled, and the navigation of these seas is reckoned very safe.

About 25 or 30 leagues to the eastward of the Niccobar Islands you lose the S. W. monsoon, and have the winds variable from west to north, sometimes S. E. S. or S. W. but mostly in the N. W. quarter, with some hard squalls and rain, which come always from the N. W. quarter, and are of great service to such ships as are bound to the south-eastward through the Straits of Malacca: in these squalls they ought to carry sail, whereby they will greatly facilitate their passage, as at other times they will frequently meet with little winds, variable, and calms, all through these straits; but as soon as you get clear, without Pedro Branco, and the islands off Point Romania, you then get hold of the S. W. monsoon again, which blows fresh all through the Chinese Seas to the Philippine Islands, &c.

The N. E. monsoon blows from October to April; but in January it is reckoned The N. E. to blow hardest; and frequently you will have much rain, and a pretty large sea, monsoon, with intervals of fair weather, throughout the China Seas; but you will be most likely to have this weather near Pulo Sapata, and off Pulo Auore, &c. yet as soon as you enter the Straits of Sincapore you lose all that rough weather, and all the way through the Straits of Malacca to Acheen Head you will have moderate and fair weather, little winds, variable, and frequent calms. Sometimes in Malacca Road you will have fresh land-winds from N. E. to E. but you do not find these winds in any other part of the straits, till you get to Acheen Head, and there you meet with the N. E. monsoon again.



Directions for sailing from Pulo Sapata to the Port of Canton in China, in the South-West Monsoon, and back again in the North-East Monsoon.

FROM Pulo Sapata steer N. E. for 24 hours; then N. E. by N. and N. N. E. so as to make about $3\frac{1}{2}$ or 4 deg. of easting, by the time you are in lat. 16 or 17 deg. N. then steering about N. will lead you fair with the Grand Ladroon. Ships generally make 3 deg. 50 min. or 4 deg. easting from Sapata to the Grand Ladroon.

Grand
Ladroon.

The Grand Ladroon is a very remarkable island in lat. 21 deg. 55 min. N. the upper part greatly resembling the dome of St. Paul's at most bearings; but, when it bears N. N. by W. or N. by E. the smaller ones, that seem to join it on each side, are like the 2 wings, but of the same figure.

Soundings.

As you approach the Grand Ladroon, you will have deeper water 6 leagues to the eastward, than 12 leagues to the westward: besides, the soundings to the eastward are mud; to the westward, sand; and in the stream of it, sand now and then mixed with mud. In lat. 21 deg. 10 min. N. and long. made from Pulo Sapata, 3 deg. 57 min. E. you have soundings 40 fathom, soft ouze, and may see the Grand Ladroon, &c. In 27 fathom, soft ouze, you will see the Affes Ears bearing N. $\frac{1}{2}$ E. and the Grand Ladroon N. N. W. 8 or 9 leagues. The Grand Ladroon bearing E. distance 2 or 3 miles, you will have 19 fathom. Here you get a pilot.

Affes Ears.

The island called the Affes Ears lies to the eastward of the Grand Ladroon, and is not very dissimilar thereunto; and therefore any land with such appearance may be depended on, as there is nothing like it to the westward.

To anchor
in case of a
gale.

On the appearance of a gale of wind, if I could not gain Cabretta Bay before night, and was the length of the Viados, or any islands west of Colong, I would anchor within them; and if not, I would run for them; for there is no danger but what is visible. It can be attended with but little, if any loss of time; and may be the safety of the masts, passage, and perhaps the ship: the want of knowing this circumstance has proved of very dangerous consequence to many.

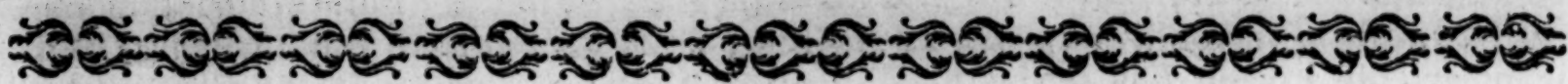
Variation.

There is but little variation all over the China Seas; in no place more than a degree; and in most only from 45 to 55 min. W. Nor did I ever find any considerable currents in these seas; perhaps 6, 8, 10, or 12 miles to the northward or southward of the reckoning in 24 hours; but this difference you will find in any other seas: and, of all the seas I ever sailed in, I never found my reckoning more exact, with respect to longitude, than in the China Seas.

From the
Grand La-
droon to P.
Sapata.

From the Grand Ladroon steer such a course, as to give a good birth to the Pratas and Paracells. The Macclesfield Shoal lies between the latitudes 15 deg. 14 min. and 15 deg. 35 min. N. and meridian distance from the Ladroon, 35 or 40 min. W. There are soundings upon it from 50 to 10 fathom, which is the least water on it: the southernmost part of this shoal is steep to. Steer to the southward, and endeavour to make Pulo Sapata, whose latitude is 9 deg. 54 min. N. and longitude, from the Ladroon, about 4 deg. W. If the weather is clear, you may see it at 9 or 10 leagues distance; and, if it should be hazy, so that you cannot see it, proceed according to the instructions above given.

Remarks



Remarks on a Passage from Manilla, through the Straits of Sincapore and Malacca, in the North-East Monsoon.

THE method generally taken to make a passage from Manilla to the Straits of Malacca is, on leaving the Bay of Manilla, to steer for the Island Cabra, or Goat Island. The course is S. W. $\frac{1}{2}$ W. distance 15 leagues. You take your departure from Goat Island, and steer to the westward, so as to go to the northward of the islands, or shoals, seen by the South-Sea Castle, and the Sabut-Jung, as mentioned in p. 82. and when you are to the westward thereof, steer for Pulo Sapata, and endeavour to get sight of it. If Sapata is not seen, and you are certain you are to the southward of it, haul in to the westward, and endeavour to get soundings, which you will soon have at 40, 45, 48, or 50 fathom, fine grey sand, in lat. 9 deg. 10 min. N. After striking soundings you may steer W. by S. for Pulo Condore, and in so doing you will shoalen your water, in the distance of 17 or 18 leagues, from 50 to 37 fathom, fine grey sand; lat. in 8 deg. 57 min. N. Continuing that course 13 leagues further, you will shoalen your water to 24 fathom, fine white sand; lat. in 8 deg. 45 min. N. and if it is clear weather, you will see Pulo Condore very plain, bearing about W. $\frac{1}{4}$ S. 11 or 12 leagues. If the weather be hazey, as it frequently is in the N. E. monsoon, it matters not your going nearer Pulo Condore; you may depend on your bearings and distances therefrom in that latitude and depth of water, and may haul to the southward for Pulo Timoan, or Pulo Auore. You may steer S. S. W. $\frac{1}{2}$ W. or S. W. by S. till you are in lat. 7 deg. 20 min. N. and you will have soundings from 24 to 21 and 22 fathom, fine white and grey sand. From thence steer S. S. W. or S. S. W. $\frac{1}{2}$ W. till you are in lat. 5 deg. 44 min. N. and you will have soundings from 22 to 26, 32, 34, 39, and 40 fathom, soft muddy ground. From thence you may steer S. S. W. S. S. W. $\frac{1}{2}$ W. or S. W. by S. till you are in lat. 5 deg. 9 min. N. and you have soundings from 40 to 42 and 44 fathom, blue clay and mud. From thence steer S. by W. $\frac{3}{4}$ W. till you are in lat. 3 deg. 20 min. N. and you will have soundings from 44 to 40, 35 and 30 fathom, coarse gravel, sand, and shells: in this latitude and depth of water you may see Pulo Timoan bearing S. 7 or 8 leagues, and Pulo Pisang S. by E. $\frac{1}{4}$ E.

At the latter end of September, or beginning of October, off Pulo Sapata, the Cat-Currents, wicks, and thereabouts, you will find very strong currents setting different ways, and running much stronger at some times than others. When it runs strongest, which is about $2\frac{1}{2}$ knots, it generally sets to the southward, from S. by W. to S. by E. for several hours together; then it will slack, and run to the S. S. W. at the rate of $1\frac{1}{2}$ knot; then run S. W. at the rate of a knot, for some time; and then will run to the S. and S. S. E. at the rate of 2 and $2\frac{1}{2}$ knots, as before. From Pulo Sapata to Pulo Condore, the current sets from S. to S. W. and W. S. W. at the rate of $1\frac{1}{2}$ or 2 knots; and from Pulo Condore to Pulo Timoan, from S. to S. S. W. about $1\frac{1}{2}$ knot.

At the S. W. Point of Pulo Timoan there are 3 very remarkable high peaks, 2 of Pulo Timoan, which are called the Asses Ears, from the resemblance they have to the ears of that animal; which cannot escape the notice of those that make this island. Those who would anchor here, coming from the northward, must go to the westward of Pulo Timoan, between it and a small island that lies to the westward of the north end of

Pulo Timoan. The channel between them is about a league broad, and has 24 fathom, mid-channel. You keep about $1\frac{1}{2}$ or 2 miles off the west shore of Pulo Timoan, in soundings from 28 to 17, 18, 20, and 22 fathom, small stones, sand and shells. The best anchorage is in a sandy bay at the S. W. part of the island, where it shoalens gradually from 22 to 10 and 9 fathom, sand and gravel, clear of rocks and foul ground. You have a good birth in 15 or 16 fathom, with the S. W. point of the island bearing about E. S. E. the bight, or middle of the sandy bay, N. N. E. $\frac{1}{2}$ E. and the north-westernmost part of the island in sight about N. N. W. There are no houses hereabouts, nor the least sign of inhabitants, though there are great numbers on the island; but no kind of refreshments to be got here. There are 2 very good watering-places in this bay: the one, a river on the east side, where boats may fill their casks with great ease; but it has a bar, which prevents their going in or out at low water: the other is at a large constant running stream on the west side the bay, where you may fill at all times: at either of them the water is very good. Here is also plenty of fire-wood for cutting, near the shore. The tides are regular here, flowing on the full and change east and west, or 6 hours: the flood sets to the N. N. W. and the ebb S. S. E. at the rate of $1\frac{1}{4}$ knot; and flows perpendicular by the shore 8 or 9 feet. For further particulars of Pulo Timoan, see p. 79.

From the above station, by steering S. S. E. for Pulo Auore, you will deepen your water from 30 fathom, coarse gravel, sand and shells, to 35 and 36 fathom, coarse sand, when Pulo Auore bears west, 5 or 6 miles: and, as it is extremely dangerous to approach the mouth of the Straits of Singapore, except the weather be clear, therefore ships generally anchor under Pulo Auore, in a fine bay on the S. W. side, where they lie till the weather clears.

Pulo Auore. Pulo Auore is a small, but high and woody island. At the S. W. part thereof is a small, but deep round bay, which makes a most excellent road, where you lie sheltered from all winds, between N. N. E. and E. S. E. and as smooth as in a mill-pond, though there run ever so high a sea without: this is occasioned chiefly by a small rocky island, which lies a small distance to the westward of the north end of Pulo Auore, and breaks off the violence of the swell from the N. E. You may run so far into the above bay as to shut in $\frac{1}{2}$, $\frac{2}{3}$, or the whole, of the rocky island, with the N. W. point of the bay, and anchor in 20 to 15 fathom, coarse sand, and all clear ground. All ships coming from the northward, that intend to anchor in this bay, should go to the westward of the island, in order to fetch into the bay, which they will not be able to do if they go to the eastward. The watering-place, which is a running stream, is on the north side of the bay, close to the sea: and here is plenty of wood for cutting. There are a great number of houses in the bay, and many inhabitants, who are very shy; yet there are little or no refreshments to be got here, except cocoa-nuts and mangoes; the latter, the worst sort of their kind I ever saw. The tides here ebb and flow about 6 feet perpendicular; but I could not find the time of its flowing. For further particulars see p. 78.

From Pulo
Auore to
Pedro Bran-
co.

When the weather appears clear and settled, weigh about midnight, in order to be near the straits mouth in the morning, and make sure of getting into the straits before night or thick weather come on, which would put you to your shifts, and expose you to great danger. From Pulo Auore steer S. by E. or S. by E. $\frac{1}{2}$ E. in order to avoid the sunken rock that lies south 6 or 7 leagues therefrom; then steer S. S. by W. or S. S. W. The course from Pulo Auore to Pedro Branco in lat. 1 deg. 20 min. N. is S. by W. 24 leagues. You will have soundings between them, in the fair-way near Pulo Auore, 30 fathom, and as you run to the southward, 27, 24, 20 fathom, sandy ground. Keep in 20 fathom till shoalening near the reef off Point Romania to 16, 15, or 14 fathom. This shoal runs a great way out (see p. 77.) and is dangerous to approach, on account of the irregular soundings on it, &c. therefore come no nearer it than 14 or 15 fathom. In that

depth

depth you will just see the low land of Point Romania from the deck: and for a leading mark to carry you clear of Point Romania Shoal, keep Bintang Hill S. by W. $\frac{1}{2}$ W. ^{Leading mark.} till you bring Barbucet Hill to bear W. $\frac{1}{2}$ S. or W. (and in hazy weather W. $\frac{1}{4}$ N.) and Point Romania W. by S. 5 or 6 leagues, when you will see Pedro Branco bearing S. W. S. W. by W. or W. S. W. In clear weather you may see it 4 leagues; but if hazy, not more than 2 or 3 leagues. Here the tides run very strong both within and without the straits mouth; but in particular off the shoal of Point Romania, and about Pedro Branco and that way. It runs the strongest in the N. E. monsoon. I have known it run at the rate of 3 or 4 knots for 10 or 12 hours together. The time of flowing is uncertain, and seldom answers calculation; so that it is not to be depended on.

As there is such a strong southerly current from Pulo Auore to the reef off Point Romania, and when you come off that and Pedro Branco, there is such a prodigious strong tide, for many hours together, as to be almost a constant current, setting mostly to the S. S. W. and S. W. you see how dangerous it is for ships to be benighted or taken in thick weather off the mouth of these straits. Should this be your case, and you cannot see the mouth of the straits, push for the Straits of Drion, provided it be early in the season, and enter the Straits of Malacca by the Carimons; but if it should be late in the season, then go for the Straits of Banca and Sunda. In the New Directory you have good directions through them. ^{Bring off the straits mouth and not seeing it.}

But if the weather is clear, steer for Pedro Branco; and when you come near it, you will deepen your water from 14 or 15 to 20, 25, or 30 fathom. Pedro Branco bears from the outermost rocks or islands off Romania E. by S. $\frac{1}{2}$ S. 2 $\frac{1}{2}$ leagues. Between these is the channel or entrance into the Straits of Singapore: you have 20 fathom near the reef, 25 fathom mid-channel, and 30 fathom near Pedro Branco. When you have sight of Pedro Branco, bearing S. W. or S. W. by W. steer so as to go 2, 3, or 4 miles to the northward of it; and when you bring Barbucet Hill on the outermost island off Point Romania, they will bear W. N. W. and you are clear of all the reef, and may keep mid-channel between Pedro Branco and the said island, and so enter the Straits of Singapore. ^{To enter the straits.}

To the southward of Pedro Branco lie many rocks both above and under water, and all foul ground round about it. Take care not to go too near it; for the tides run very strong to the S. S. W. amongst the rocks and shoals about Pedro Branco; but pass it as above directed: and should it be near night when a-breast of Point Romania, it is best to haul under the point in 18 fathom, and anchor for the night, taking day-light to go through the narrows.

Being past Pedro Branco and a-breast Point Romania, the straits are wide, and no danger. From Point Romania St. John's Island lies W. by S. $\frac{1}{2}$ S. distance 13 leagues: you will have soundings in this channel from 18 fathom, on the north shore, to 20 and 25 fathom, mid-channel, and 30 fathom on the south side the channel: steer W. by S. for St. John's Island, and when you see it, keep it bearing W. by S. as a good leading mark to carry you clear of all danger. The south side of these straits is foul ground and shoal, abounding with many rocks above and under water: it is best therefore keeping on the north shore, in 18 or 20 fathom, till you are up with, or a-breast, Jehore River, off which lies a sand-bank; the marks for which I have already given in p. 77. When you have passed this sand, the north side is all clear, but the south side still continues foul. ^{From Pedro Branco to St. John's.}

Being a-breast of St. John's Island, your course to Barn Island is W. by S. 4 leagues: you have irregular soundings from 30 to 25, 20, and 18 fathom, shoalening 5, 6, or 8 fathom at a cast, and sometimes 10 or 12 fathom: towards the south shore it deepens to 40 and 50 fathom, and then shoalens again suddenly. St. John's Island is bold to, and you ^{From St. John's to Barn Island.}

Dangers on
the south
shore.

Tides.

Anchorage
off Barn I.

From Barn
Island to
Carimons.

From Tan-
jan-boulus
to Pulo Pi-
fang.

you have good soundings from 20 to 15 fathom very near it. If day-light or the wind fail you, it is best anchoring under St. John's Island in 15 or 16 fathom, soft ground, 1 or 2 miles off shore, the island bearing from W. S. W. to S. W. by W. From St. John's Island S. E. $\frac{1}{2}$ S. lies a ridge of rocks plain to be seen; and without them a shoal W. by S. 2 leagues further. From St. John's Island S. W. $\frac{1}{2}$ S. 3 miles, and from Barn Island E. by S. $2\frac{1}{2}$ leagues, there lies a single black rock above water, about the size of a ship's long-boat, and is $\frac{1}{3}$ of the channel from the south side of the straits. From Barn Island S. E. by S. 4 or 5 miles, there lies a ledge of rocks; for further particulars of all which see p. 76. Between these rocks and the Island Rabbet and Coney is the channel, in which you have irregular soundings, between 20 and 30 fathom, rocky ground. You may pass the Rabbet and Coney, within $\frac{1}{4}$ of a mile, in 20 or 22 fathom. Barn Island bears from St. John's W. by S. about 4 leagues. The tides here run very strong as the islands lie; the flood E. by N. and the ebb W. by S. The time of flowing is uncertain. They run longest to the eastward in the S. W. monsoon, and longest to the westward in the N. E. monsoon. When a-breast the Rabbet and Coney, you may see the tree on Tree Island bearing W. $\frac{1}{4}$ S. and Red Island S. W. by W. From hence to the west part of Barn Island you have soundings from 22, 20, 16, 15, 14, 12, 10, to $9\frac{1}{2}$ fathom, on a gravelly bank, about $\frac{3}{4}$ of a mile to the westward of Barn Island, where I would advise you to anchor if night be coming on, and take day-light to pass Sandy Island, on account of the uncertainty of the set of the tides, and the irregularity of the soundings. I shall refer you to the marks, &c. for anchoring on the above-mentioned bank, in p. 75.

From the south part of Barn Island, the north part of the Little Carimon bears W. $\frac{1}{4}$ S. $6\frac{1}{2}$ or 7 leagues; and the tree on Tree Island W. by S. 5 or 6 miles; which tree also bears, from the north peak of the Great Carimon, E. $\frac{1}{4}$ N. For a description of Tree Island, see p. 75. Between Barn Island and Tree Island is the channel out of the straits of Singapore. You have soundings, mid-channel between them, from 24 to 30 and 33 fathom, and may stand towards Tree Island into 16 or 15 fathom, but no nearer; and into 10 or $9\frac{1}{2}$ towards Barn Island. You have soundings also off the west part of Tree Island, to the northward of it, 1, $1\frac{1}{2}$, and 2 miles, from 20 to 23, 26, and 27 fathom; and as you go to the westward, you shoalen it to 20, 18, and 17 fathom. Being a-breast Barn Island, steer W. N. W. or N. W. according as you have the winds and tide, observing the directions and leading marks for going clear of Tree Island in p. 76. Another leading mark is, to keep the south part of Barn Island E. $\frac{1}{2}$ S. which will lead you clear of all danger from Tree or Sandy Island. You have soundings from Barn Island, with these bearings, from 10 or 12 fathom; near Barn Island, to 20, 25, or 30 fathom, as far as the west part of Tree Island; and to the westward of that, in the fair-way, from 24 to 20 and 17 fathom, ouzey ground. Being past Tree or Sandy Island, steer for the middle of the opening between the Little Carimon and Tanjan-boulus: the course is about W. by N. You have both these places described in p. 75. with an account of the tides hereabouts.

From Tanjan-boulus to Pulo Cocob is N. W. by W. 3 or 4 miles. Pulo Cocob is hardly to be known for an island, till you are close up with it. From Pulo Cocob Pulo Pisang lies N. W. $\frac{1}{2}$ W. $5\frac{1}{2}$ or 6 leagues, and from the N. E. point of the Little Carimon N. N. W. $\frac{3}{4}$ W. 8 or $8\frac{1}{2}$ leagues. You have soundings from Pulo Cocob to Pulo Pisang, in the fair-way, from 17 to 18 and 20 fathom; and as you come near Pulo Pisang you will shoalen your water to 16 fathom; for there is a flat which runs off for above a mile from this island. If the wind scant, you may borrow upon Cocob to 17 or 18 fathom, and upon Pisang to 11 or 12 fathom, about 2, or $2\frac{1}{2}$ miles; neither should you keep a greater distance from it than 5 or 6 miles, on account of the bank on the opposite

opposite side of the channel. Between these 2 islands the Mallay Coast is all flat and shoal water: therefore come no nearer it than 12 or 14 fathom; or bring Pisang to bear no further to the westward than N. W. $\frac{1}{2}$ N. nor stand nearer than 15 fathom to the Sumatra side, under which depth it is foul ground and shoal water, particularly when the east point of the Carimons bears S. E. $\frac{1}{2}$ E. 4 or 5 leagues, and the outermost of the Two Brothers right on with it, distance about 3 leagues; and Pulo Pisang N. $\frac{1}{2}$ E. 4 leagues; it shoalens suddenly from 15 fathom, soft ground, to 9 fathom, hard.

There is a bank also off Pulo Pisang, which lies W. N. W. and E. S. E. 7 or 8 leagues in length. From the east part whereof Pulo Pisang bears E. N. E. $\frac{1}{2}$ E. or N. E. by E. distance about 3 leagues; and from the west part thereof Formosa Hill bears N. E. by N. and Pulo Pisang E. by S. 8 leagues, or just in sight. On this bank the America was forced to anchor in 5 fathom: she was steering N. W. by N. and they shoalened the water as quick as they could heave the lead one cast after another, from 14 to 10, 9, 7, and 5 fathom, when they anchored and sent the boat to sound $\frac{1}{2}$ a mile round to the southward, and found no less than 5 fathom, hard ground: the north side of it deepened very quick to 19 fathom. Pulo Pisang then bore E. $\frac{1}{2}$ N. 2 leagues; the N. E. point of the Carimons, S. E. $\frac{1}{2}$ S. 9 or 10 leagues; and Mount Formosa, N. N. W. $\frac{1}{2}$ W. 8 or 9 leagues: by which I am convinced, that we went without this shoal, going to Manilla. Between this bank and Pulo Pisang the leading mark is to keep Formosa Hill N. N. W. $\frac{1}{2}$ W. and the Carimons, S. S. E. $\frac{1}{2}$ E. in between 22 and 24 fathom, mid-channel. See p. 73 and 74.

The bank
off Pulo-Pi-
sang.

Being a-breast Pulo Pisang, in 11 or 12 fathom, 2 or 3 miles distance, a N. W. or N. W. $\frac{1}{2}$ W. course will carry you clear of all danger, in soundings from 22, 20, to 15, 12 fathom, ouzey ground. If you shoalen your water to 11 or 12 fathom, keep more to the westward; if you deepen it to 20 fathom, keep more to the northward. I ran through this channel in the night, in the following manner, viz. At 8 P. M. I was a-breast Pulo Pisang, the south part thereof bearing E. N. E. $\frac{1}{2}$ N. 2 or 3 miles, in 17 fathom. I passed by the island in 11 $\frac{1}{2}$ and 12 fathom. I then steered N. W. and N. W. $\frac{1}{2}$ W. When I shoalened the water to 13 or 12 fathom, I kept N. W. $\frac{1}{2}$ W. and when I deepened it to 14 $\frac{1}{2}$ or 15 fathom, I steered N. W. From 8 P. M. to 2 A. M. I made the course good N. W. $\frac{1}{4}$ W. 7 leagues: I had in that run soundings from 12 to 15 fathom. At 2 A. M. the wind scanted upon me, by coming to the northward. From 2 to 6 A. M. the course made good was W. N. W. $\frac{1}{2}$ N. 4 leagues, in soundings from 17, 20, 24, and 25 to 28 fathom, when Pulo Pisang bore E. by S. $\frac{3}{4}$ S. 9 or 10 leagues, and Mount Formosa N. N. E. $\frac{1}{2}$ E. 5 or 6 leagues. By this you see the above course may be depended on to carry you clear of all danger. After you have passed Pulo Pisang there is no danger on the north side, till you come near Mount Formosa, off which there lies a shoal stretching about 2 leagues along shore; from the S. E. part whereof Mount Formosa bears N. E. by N. and Mount Moora N. W. by N. and from the N. W. part they bear E. $\frac{1}{2}$ S. and N. by W. But this shoal lies pretty much out of a ship's track, they having no business so near in shore. The tides hereabouts are very uncertain, but set longest and strongest to the westward and north-westward.

From Pulo
Pisang to
Mount For-
mosa.

The shoal
off Mount
Formosa.

From Mount Formosa the coast runs N. W. 4 $\frac{1}{2}$ or 5 leagues to Mount Moora, a single hill near the sea shore, the land near it being low, though in the country the land is very high and mountainous. Mount Moora bearing N. by W. 5 or 6 leagues, and Mount Formosa N. E. $\frac{1}{2}$ E. 3 or 4 leagues; in 23 or 24 fathom you may discern Pulo Pisang from the deck, bearing about E. S. E. $\frac{3}{4}$ S. 9 or 10 leagues; and the outermost of the Water Islands, which are high, N. W. about 10 leagues. Steer for the Water Island in soundings from 20, 22, 24, 25, to 26 fathom. In the offing you will have 28 or 30 fathom; but you may pass close by the Water Islands, and have 24 fathom within

From M.
Formosa to
Malacca.

94 *Sundry REMARKS and OBSERVATIONS made in*

2 or 3 miles of them: luff up close round these islands for Malacca Road, where in the N. E. monsoon the wind is generally northerly.

Malacca.

You may lie in Malacca Road in depth of water from 5 to 12 or 13 fathom, the church and high land in one, or nearly so, bearing E. N. E. or N. E. by E. For a further account of this place see p. 73.

From Malacca to C. Richado.

From Malacca Road to Cape Richado, the course is N. W. by W. distance 10 leagues: the depth of water between them, 14, 16, 18, 20, 23, 25 fathom. When Cape Richado bears N. E. $2\frac{1}{2}$ miles, you will have 25 fathom.

From the Water Islands to C. Richado.

From the Water Islands to Cape Richado the course is N. W. $\frac{1}{2}$ N. distance 12 leagues: the soundings from 24 to 20, 16, 18, 20, 25 fathom: from 3 to 6 miles off shore, Cape Richado bearing N. W. distance between 3 and 4 leagues. And off shore 4 or 5 miles lies a hard bank with 13 fathom on it; but within and without it, from 20 to 24 fathom. I have been on this bank; had, when going on it, 20, 18, 17, 13 fathom, and going off it, 14, 17, 21 fathom. When we had 13 and 14 fathom, had hard ground. Off it the ground is ouzey. Mid-way between Malacca and Cape Richado lies a rock above water, about a mile off shore; but ships have no business so near in shore. The variation off Cape Richado, 1763, was 1 deg. 20 min. W. For further particulars relating to Cape Richado see p. 72.

From Cape Richado to Parcelar.

From Cape Richado to the land a-breast Parcelar Hill the course is about N. W. northerly, distance 13 leagues: you have soundings between them from 16 to 20, 30, and 35 fathom, but very irregular: keep in from 18 to 25 fathom. In clear weather, when a little to the westward of Cape Richado, you will see Parcelar Hill bearing N. W. by N. or N. N. W. $\frac{1}{4}$ W. 13 or 14 leagues. The channel between the coast and South-Sand is about 4 leagues wide; the soundings, from 16 to 20 fathom on the coast side; 30 fathom, mid-channel; and 35, and in some places 40 fathom towards the South-Sand. All the way from Cape Richado to Parcelar the coast is low and level. You have pretty regular soundings about 4 or 5 miles off shore, from 18 to 25 fathom, which is a good depth to keep in: the ground ouzey, and good anchorage. The variation off Parcelar, 1762 and 1763, 16 min. W. For the dangers, &c. between these 2 places, see p. 72.

From Parcelar to the Arroes.

Being a-breast of Parcelar Hill, or it bearing E. $\frac{1}{2}$ N. or E. $\frac{1}{4}$ N. 3 or 4 miles off shore, in 17, 18, or 19 fathom, shape your course for the Arroes, with respect to the winds and tides, taking care to keep Parcelar Hill E. $\frac{1}{4}$ N. or E. which will lead you through between the North and South Sands, clear of all danger; but be sure you do not bring it to the southward of east, for E. $\frac{1}{4}$ S. will bring you on the $2\frac{1}{2}$ fathom bank. The tides here set very strong; the flood S. E. by E. and the ebb N. W. by W. It flows, full and change, E. S. E. and W. N. W. or $7\frac{1}{2}$ hours; and perpendicular 9 or 10 feet. You have soundings in the fair-way, from 17 or 18 fathom, 3 or 4 miles from the low land off Parcelar, to 20, 22, 24, 21, 20, 17, 15, 12, 10, and $9\frac{1}{2}$ fathom; Parcelar Hill then bearing due east, and the low land just in sight from the poop: you are now on the easternmost bank in the channel, and a-breast of the $2\frac{1}{2}$ fathom bank, which bears north of you about 2 miles: from hence you may see the Round Arroe from the main-top, bearing W. $\frac{1}{2}$ S. I had the above bearings and depth of water, when the Weymouth, coming through in company with us, was in 6 fathom water; Parcelar Hill bearing of her E. 2 deg. $\frac{1}{2}$ S. At the same time she bore of us north $1\frac{1}{2}$ or 2 miles; and her boat, which was foundering about $\frac{1}{4}$ of a mile to the northward of her, had 3 and $2\frac{1}{2}$ fathom, when Parcelar Hill bore of them E. $\frac{1}{4}$ S. Steering from thence to the westward, with Parcelar due east; you deepen your water from $9\frac{1}{2}$ or 10 fathom to 14, 18, 20, and 22 fathom, and then shoalen it from 22 to 20, 18, 16, 15, 12, $11\frac{1}{2}$, $10\frac{1}{2}$, and 10 fathom, on the westernmost bank, and between the North and South Sand-Heads; Parcelar Hill bearing east 8 or 9 leagues, and the Round Arroe, seen from the deck, W. 8 deg. S. 7 or 8 leagues. From thence, steering as before, you have, for several

casts

casts of the lead, $10\frac{1}{2}$, 11, 12, $12\frac{1}{2}$, 13 fathom, and will soon deepen your water from 13 to 17, 19, and $24\frac{1}{2}$, or 25 fathom, clear ground, sand and gravel: still continuing as before, you will have from 25, 24, 23, 22, 20, to 19 fathom; and then, Parcelar Hill bearing east 10 or 11 leagues, and the Round Arroes W. 6 deg. S. 5 or 6 leagues, you are clear of all the sands, and may steer W. N. W. or N. W. by W. so as to pass by the Arroes within 3 or 4 leagues of them; in which course, till you come within that distance, Pulo Arroes, you will shoalen your water from 19 to 16, 15, and $14\frac{1}{2}$ fathom, when Parcelar will bear E. 3 deg. S. about 12 leagues; the Round Arroes W. 17 deg. S. 4 or 5 leagues. The water shoalens gradually towards the Arroes from 15 to 14, 12 and 13 fathom, 5 or 6 miles off the Arroes; ouzey ground, and good anchorage, if benighted, or the wind and tide against you.

The Round Arroes is a leading mark through the channel between the North and South Sand-Heads, and may be seen from a large ship's poop, in clear weather, 7 or 8 leagues; but none of the others above 4, 5, or 6. See a further description of the Arroes, and the sands, &c. in this channel, in p. 70 and 71. It flows here, on the full and change, east and west, or 6 o'clock; the flood S. E. by S. and the ebb N. W. by N. 6 hours each way, in general; but as the tides have great dependence on the winds, I have known several instances of their irregularity, the ebb running strong for 9 hours together in the N. E. monsoon, and the flood as long in the S. W. monsoon. The tides running pretty Tides. strong here, occasion a great ripling, as if on some shoal or danger; but there is none. After you have passed the Arroes to the northward, you lose the tides, or they are no longer to be accounted for.

Being off the Arroes, the Round Arroes bearing S. W. about 4 leagues, and the Long From the Arroes W. $\frac{1}{4}$ S. you have 19 fathom water; but steering N. N. W. or N. W. by N. you Arroes to will soon deepen your water from 19 to 22 and 25 fathom; and when the Round Arroes Pulo Jarra. bears S. S. W. $\frac{1}{2}$ W. 4 or 5 leagues, and the Long Arroes W. S. W. $\frac{1}{4}$ S. you will have 33 fathom: hereabouts you meet with the ripling of the tides as above mentioned. As you go to the northward, you will soon deepen your water to 40, 42, and 44 fathom, which will not continue long; for in a small distance you shoalen your water again to 34, 35, or 36 fathom, which depths will continue all the way to Pulo Jarra. The course from the Arroes to Pulo Jarra is N. N. W. 25 or 26 leagues; in regular soundings from 32 to 37 fathom, sand, and ouzey bottom: but in the N. E. monsoon, ships generally steer from the Arroes N. W. or N. W. $\frac{1}{2}$ N. in order to go between Pulo Jarra and Pulo Varella. A N. W. course will carry you 6 or 7 leagues to the westward of Pulo Jarra, in soundings from 37 to 32, 30, 32, 36, and 38 fathom; when Pulo Jarra bears N. E. $\frac{1}{2}$ N. 6 or 7 leagues, and Pulo Varella W. You may pass on either side Pulo Jarra, which is steep to, having 30 and 35 fathom close to it. Hereabouts you generally have the current setting to the N. W. at the rate of 20 miles in the 24 hours; as it does all Current. along the Mallay shore, in the N. E. monsoon: but the reverse on the Sumatra side, where you find a southerly current. The variation, off Pulo Jarra, in 1763, 38 min. W.

Pulo Varella is a small, round, but very high island, lying from Pulo Jarra W. by S. Pulo Varella $\frac{1}{2}$ S. 15 or 16 leagues, with soundings between them from 38 to 40 and 45 fathom.

We went between Pulo Jarra and Pulo Varella, and were 6 days getting to Pulo A caution Rondó, by keeping to the westward, along the Coast of Sumatra, where we met with not to go to mostly northerly winds, and a southerly current; for which reason I would not advise the west- ships to go that way, but keep along the Mallay Coast, to the eastward of Pulo Jarra ward of Pu- and Pulo Pera, where you may anchor if the wind or current should happen to be against lo Jarra. you.

From Pulo Jarra to Pulo Pera, the course is N. N. W. $\frac{1}{2}$ W. distance 42 leagues. You From Jarra have soundings between them from 25 to 35 and 40 fathom, fine white sand, sometimes to Pulo Pera sand.

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Variation. sand and mud; and, as near Pulo Pera you deepen your water, viz. when Pulo Pera bears N. W. or N. W. $\frac{1}{2}$ N. 6 or 7 leagues, you have from 48 to 50 and 52 fathom, ouzey ground; and to the northward of Pulo Pera you have no soundings without 60 or 70 fathom of line. I made the variation, by several observations, off Pulo Pera, 7 min. W. and at other times 6 min. E. in the year 1762; so that it may be said there is no variation in these seas. Off Pulo Pera you meet with the true N. E. monsoon.

From Pulo Pera to the Niccobars.

From Pulo Pera steer for the Niccobar Islands: the course is W. by N. distance 98 or 100 leagues. The S. W. part of the Niccobars lies in lat. 6 deg. 45 min. N. and 4 deg. 55 min. W. long. from Pera. Or you may shape your course for Pulo Rondo, in lat. 6 deg. 5 min. N. and long. 3 deg. 43 min. W. from Pera, the northernmost of the islands off Acheen Head, from whence the Niccobars bear W. 30 deg. N. 28 or 29 leagues.

Directions and Cautions how to fall in with the Land, according to the different Places you may be bound to, from the Niccobar Islands.

If bound to Bengal.

IF you are bound to Bengal in the N. E. monsoon, you ought to keep along the Mallay Coast, and go well to the northward before you stretch over, in order to make great allowance for the southerly currents, and the winds, which sometimes hang much to the northward.

If bound to the Coast of Coromandel

If you are bound to the Coast of Coromandel, in the N. E. monsoon, you may go through the Sambrere Passage, in lat. 7 deg. 36 min. N. which is a safe and clear passage: I have gone through it in the night with a squadron of men of war. But, go through which passage you will, you ought to shape your course so as to fall in with the land to the northward of your port, on account of the current running always to the southward; and when you come in with the land, you will have the winds mostly from the northward; for, should you fall to the southward of your port, you may lose much time, and have much trouble, in getting to it, by striving against both wind and current. But, if you are bound to the Coromandel Coast in the month of March or April, keep well to the southward, and endeavour to fall in with Zeloan about the Friar's Hood, coasting it along Zeloan to Point Pedro, where you will have variable winds, and a strong northerly current in your favour. See my former Directions for coasting round Zeloan to the Coast of Coromandel, in both monsoons, in p. 36, &c.

If bound to the Coast of Malabar.

If you are bound to the Malabar Coast, in the N. E. monsoon, it will be proper to fall in with the Island Zeloan about the Friar's Hood, or between that and the Basses: but be sure to fall in to the northward of the Basses, and keep the Coast of Zeloan close on board; for the current then sets strong round the island to the south-westward; and, should you be drove off the Coast of Zeloan, you may not be able to regain it. Some ships, by not observing this precaution, have been drove off Zeloan, and through amongst the Maldivé Islands; whereby they have been exposed to great danger and hardships. The meridian distance between Pulo Rondo and the Great Basses is $11\frac{1}{2}$ deg. and from the southernmost Niccobar, $10\frac{1}{2}$ deg. But trust not too much to your reckoning; for the currents are very deceiving in these seas, and I have known ships that have made the land with little more than half that meridian distance. See other instances of the uncertainty of these currents in p. 50.

Remarks

Remarks and Instructions for sailing from Point de Gall to Cape Comaroon, or from Cape Comaroon to Point de Gall, in either Monsoon.

I Shall, in the first place, give you the true bearings and distance of these places, Bearings & which, from my own experience in crossing this gulph several times, I know to be distance of just. Cape Comaroon bears from Point de Gall W. 33 deg. N. or N. W. by W. P. de Gall, & C. Co-maroon, one from another. distance 65 or 66 leagues. This bearing and distance you may depend on, since I have often experienced the truth thereof in both monsoons. I have several times made my course from Gaula W. 30 deg. N. distance 58, 59, or 60 leagues, being in lat. 7 deg. 38 min. N. and long. made 2 deg. 31 min. W. when I have seen Cape Comaroon bearing N. N. E. or N. E. by N. 5, 6, or 7 leagues; and had soundings from 30 to 35 fathom. And in the S. W. monsoon I have made my course from Cape Comaroon E. 32 deg. S. distance 59 leagues, when Point de Gall bore E. by S. 4 or 5 leagues, and had 44 fathom, coarse sand.

In the N. E. monsoon the currents are very uncertain about Point de Gall, and in crossing the Gulph of Manara. They set off Gaula W. S. W. and in the opening of the gulph they have often been found to set S. W. very strong; so that several ships, in light winds and calms, have been driven suddenly on the Maldiv Islands: this I have known to happen to several ships, the time I was in India: to avoid which I would advise all ships to round the Island Zeloan, at least as far as Caltura, a Dutch fort and settlement about half way between Gaula and Columbo, from whence, and not before, you may safely cross to Cape Comaroon: and if, unexpectedly, you should happen to make the land to the eastward of Cape Comaroon, avoid coming too near the coast; for it is encompassed with many rocks and dangers.

But, in the S. W. monsoon things are quite reversed: you must therefore take care of the currents, which set strong into the Gulph of Manara; whereby many ships have been driven to the northward into the gulph, and with great difficulty and loss of time have got out of the gulph again, though not without some danger of being lost. The experienced navigator will either way be upon his guard.

These are very necessary cautions to navigators, whom I would by all means advise to observe them; though I must say, the several times I have crossed this gulph, I never experienced any of these strong currents: nor do I believe any ship, that keeps Zeloan close on board, within 2, 3, or 4 leagues of the shore, until she gets to the northward as far as Caltura, will meet with any of these strong currents. I have many times, between Gaula and Caltura, had strong northerly currents in my favour; and, however strong the current may run to the S. W. or W. S. W. to the southward of Gaula, you lose it all as soon as you get in shore to the northward of Gaula; and it is ships that do not observe this caution, that are driven off Zeloan, among the Maldiv Islands, &c.

Remarks and Directions for coasting along Zeloan, from Point de Gall to Caltura; and crossing from thence to Cape Comaroon, in the North-East Monsoon.

Being 2 or 3 leagues off Point de Gall, with the Haycock and it in one, bearing N. From Point de Gall to Caltura, by E. $\frac{1}{4}$ E. you will have 30 fathom. From thence I would advise you to coast it along shore as far as Caltura, (a Dutch settlement, where they have a considerable fort, on a rising ground near the sea) taking care to keep from 2 to 4 or 5 leagues off shore, in depths

What
depths to
keep in.

depths of water, in the day-time, from 44 or 40 to 25 or 20 fathom; and under that depth I would not advise you to go; for there are several straggling rocks lying 2 or 3 miles off shore, to the northward of Gaula, and between that and Caltura, several of which have 16 or 18 fathom close to them; and in 25 fathom you will not be more than 3 miles off shore: in the night-time, I would advise you not to go under 28 or 30 fathom; for in some places, in that depth, you will not be more than 4 or 5 miles off shore; and, night or day, not to go without 40 or 44 fathom; for, if so, you will soon be off the bank, and have no soundings: and if it should then prove light winds or calm, and the current southerly, you will be drove back again, or perhaps off the coast; which may be prevented by keeping in the depths above mentioned, where you may anchor on occasion, and keep what you have got.

Off Cal-
tura.

As you come near Caltura you may make bolder with the shore, and stand into 15 or 16 fathom, clear sandy ground. This I have frequently done; and by standing in shore, in blowing weather, you will find the sea very smooth. I have stood into 13 fathom, Caltura bearing N. N. E. $\frac{1}{2}$ E. 4 or 5 miles off shore. I have also stood in with the said fort, bearing E. S. E. $\frac{1}{2}$ S. and had from 15 to 10 fathom 4 or 5 miles off shore: then the extremes of land to the northward bore north. Off Caltura the variation was 18 min. E. in the year 1760. Caltura and the Haycock are in one, bearing S. E. $\frac{1}{2}$ S.

Currents
along shore.

I have several times coasted it along this part of Zeloan, and have sometimes found a small southerly current, and frequently no current at all; and have found, when it has blown very fresh at N. or N. N. E. for 24 hours together, a very strong northerly current, with which, by keeping within the depths above mentioned, I have turned it up along shore, and gained a great deal of ground.

From Caltura, in lat. 6 deg. 37 min. N. and long. 79 deg. 42 min. E. from London, you may with safety stretch a-cross the Gulph of Manara for Cape Comaroon, which bears from Caltura W. 28 deg. N. or W. N. W. $\frac{1}{2}$ N. distance 54 leagues. I have taken my departure from Caltura, and made my course W. 22 deg. N. distance 49 leagues, when I saw the land about Cape Comaroon, bearing N. N. W. $\frac{1}{4}$ W. distance 6 or 7 leagues, and had 26 fathom water.

For instructions to sail from Cape Comaroon to Point de Gall, I shall refer you to those already given in p. 35.



A Description of all the Ports, Headlands, Islands, Rocks, &c. with their Bearings and Distance from one to the other; as also their Latitude and Longitude, and the Soundings and Variation of the Compass; with whatever else is remarkable, from Cape Comaroon to the Island Bombay.

Cape Co-
maroon.

CAPE Comaroon lies in lat. 7 deg. 56 min. N. and long. 77 deg. 25 min. E. from London. The variation, 1763, was 41 min. W. I have several times been very near this cape: its extremity is level, low land, covered with trees, and cannot be seen, from a ship's deck, more than 4 or 5 leagues; so that few ships which come this way see the cape, but a little hill to the northward thereof, which appears like an island when it bears from N. E. by N. to E. S. E. and this is what people in general take for the cape, and set as such. A little to the northward of this hill begins the chain of very high

high mountains, which stretch a great way in land to the northward, and are called the Mountains of Gatta; which may be seen 8, 9, or 10 leagues, at sea.

There are good soundings all about Cape Comaroon. To the eastward, the cape Soundings. bearing N. W. you have from 35, 30, 25 to 22 fathom, coarse brown sand, about 5 leagues off; the cape bearing N. by E. 4 leagues, you have 20 fathom; ditto N. E. $\frac{1}{2}$ N. 4 or 5 leagues, 24 fathom; ditto N. E. by E. 3 leagues off shore, 24 fathom, coarse sand; ditto E. $\frac{1}{2}$ S. and the extremes of land to the northward N. by W. $\frac{1}{2}$ W. off shore 4 leagues, 30 fathom; the cape from N. N. E. to N. E. by N. 7 or 8 leagues, 38 fathom, muddy ground; ditto N. E. by N. 6 or 7 leagues, 35 fathom, ouze, with some sand; when the extremes of the land to the northward will bear N. by W. The cape E. N. E. and the extremes of the land to the northward, N. by W. $\frac{1}{2}$ W. off shore about 4 leagues, you have 24 fathom, sandy ground.

On Nov. 13, 1759, being at noon, by a good observation, in lat. 7 deg. 46 min. N. A rock discovered by his Majesty's ship Elizabeth. the little hill that appears like an island to the northward of the true Cape Comaroon bearing N. E. $\frac{1}{2}$ N. and the extremes of land to the northward N. by W. off shore 6 or 7 leagues, had 35 fathom. From noon to 2 P. M. the course steered was N. by E. 2 $\frac{1}{2}$ miles, when we saw breakers on a sunken rock, which must be very near the surface of the water, by the sea's breaking on it, whilst elsewhere it was so very smooth. We saw the breakers very plain for 15 or 20 minutes, and passed within a mile of them. When they bore S. E. $\frac{1}{2}$ E. about 1 $\frac{1}{2}$ mile, we sounded and had 35 fathom, the extreme part of the hill, which we set for Cape Comaroon, bearing N. E. a little northerly; and the northernmost land in sight N. by W. Our distance from what we took for the cape, as near as we could judge, was 6 or 7 leagues. This is a dangerous rock, but it is very small.

From Cape Comaroon to Point Cadiapatam the course is W. N. W. $\frac{3}{4}$ W. distance Point Cadiapatam. 6 leagues. This Point of Cadiapatam forms the east side of Coleche Bay, and is very remarkable; being a very red, steep land, close to the sea, with a grove of tall trees on the extremity of it. From this point inlandward the land rises to a tolerable height, at the top whereof is another grove of tall trees, which seem very regular: this is the highest land in sight near the sea.

S. S. W. from Cadiapatam Point, distance 3 or 4 miles, there are two little islands Two small islands, and a rock. surrounded with rocks and foul ground; and S. $\frac{3}{4}$ E. from the northernmost of these there is a rock even with the water, except only about the bigness of a cask of it above water. This is the same with that mentioned, in the New Directory, as appearing like a buoy. It lies about 6 or 7 miles off shore, and has 13 fathom within a boat's length of it; 17 fathom about $\frac{1}{4}$ of a mile without it; 19 $\frac{1}{2}$ and 20 fathom about half a mile without it; and 22 fathom about a mile without it; and only 23 fathom 1 $\frac{1}{2}$ or 2 miles without it, sandy ground. I have sounded all about this rock, and took the following bearings upon Bearings from the rock. it, viz. the northernmost of the small islands N. $\frac{3}{4}$ W. the outermost high land of Cape Comaroon E. by N. $\frac{1}{4}$ N. the outermost low land, which is the very pitch of the cape east, distance about 5 leagues; Point Cadiapatam N. N. E. $\frac{1}{2}$ E. and the extremes of the land to the northward N. W. $\frac{1}{2}$ N. off shore 6 or 7 miles. I would not advise you to go under 28 or 30 fathom hereabouts in the night-time, or hazy weather; for the coast hereabouts is very foul and dangerous, having many straggling rocks lying a great way off shore.

From Point Cadiapatam, 4 or 5 miles to the westward, is Coleche Bay. On the shore Coleche B. hereabouts are several buildings like pagodas. On the west side of Coleche Bay, begins a pretty high red land, intermixed with white, near the sea, and very steep to seaward: this land continues about 2 or 3 leagues to the westward of Coleche Bay, and there ends.

From Coleche Bay, as far as Ruttera Point, you see high mountains in land; and some Ruttera small Point.

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small distance from the sea, you see tolerable high land, which stretches to the northward as far as Ruttera Point, where it ends. Ruttera Point is close to the sea, and seems to stretch from the last-mentioned high land. Ruttera Point is a low level land, which terminates in a bluff to seaward, and is higher than any land hereabouts near the sea. There is a church a little to the southward of this point, by which it may be known; and several other buildings along shore.

From Point Cadiapatam to Ruttera Point.

From Point Cadiapatam to Ruttera Point the course is N. W. $\frac{1}{2}$ W. 11 or 12 leagues. You have soundings between them from 24 fathom, 3 leagues off Cadiapatam, to 30 fathom, 4 or 5 leagues; to 35 or 40 fathom, 6 or 7 leagues off shore. When you are to the northward of Coleche Bay, you may go into 20 fathom, 2 miles off shore, to 30 or 34 fathom, 4 or 5 leagues off shore. And off Ruttera Point the water deepens, there being 24 and 27 fathom 3 or 4 miles from it; 33 fathom 4 leagues off; and 35, 40, or 45 fathom from 4 to 6 leagues off, sandy ground.

And here it may not be amiss to observe, that the Coast of Malabar lies N. N. W. and S. S. E. so that, being 5 leagues off Ruttera Point, a N. N. W. course will carry you along shore to the Island Kanary, (a little to the southward of Bombay) and as far without it as you were from Ruttera Point; and a S. S. E. course from Kanary will carry you the same distance off Ruttera Point, as I have several times experienced. There are good and regular soundings all along this coast, only in some places deeper, and others shoaler water; of which I shall take particular notice in their places, as we go along.

From Ruttera Point to Anjanga.

From Ruttera Point to Anjanga, the course is N. by W. $\frac{1}{2}$ W. distance 7 leagues: the coast between them is low to seaward, but covered with trees, which makes it seen at a pretty good distance. There are high mountains in land, at a great distance, and along shore there are several buildings: the coast is bold and clear, having 11 or 12 fathom within $1\frac{1}{2}$ mile of the shore; 24 or 25 fathom $2\frac{1}{2}$ or 3 leagues off shore; and 30, 35, to 40 or 45 fathom from 4 to 6 leagues off shore.

Anjanga.

Anjanga lies in lat. 8 deg. 42 min. N. and long. 76 deg. 25 min. E. from London. The variation here, 1763, was 28 min. W. You may anchor, in Anjanga Road, in 11, 12, or 13 fathom water, the red cliffs bearing N. N. $\frac{1}{2}$ W. the flag-staff E. N. E. $\frac{1}{4}$ E. the extremes of the land to the southward S. E. $\frac{1}{4}$ S. off shore $1\frac{1}{2}$ or 2 miles. About 4 or 5 miles to the northward of Anjanga there are some pretty high and steep red cliffs, close to the sea, where may be had fresh water: but there being always a great surf on the shore makes it very tedious watering. The water at Anjanga is both bad and scarce.

Quilon.

Red Cliffs.

Soundings off the coast.

About 5 leagues to the northward of Anjanga, is the Dutch settlement of Quilon, a very inconsiderable place. From the Red Cliffs, which are 4 miles to the northward of Anjanga to Quilon, and, indeed, a great way to the northward of Cochin, the coast is very low, and only to be discerned by the trees upon it. The soundings are gradual to the shore: you have 10 or 11 fathom 2 miles off shore; 22 or 23 fathom, 3 leagues off shore; and 28 fathom, 5 or 6 leagues off shore; which is as far as you can see the land off deck.

From Anjanga to Cochin.

From Anjanga to Cochin the coast lies N. N. W. $\frac{1}{4}$ W. distance 28 leagues. You may coast it along shore in from 10 to 20 fathom; and after you are to the northward of Quilon, you may coast it to Cochin from 7 to 16 fathom; in which depths you will be from 4 miles to 4 leagues off shore.

From Porca to Cochin, &c.

Soundings.

From Porca, or Porcat, a Dutch settlement, to Cochin, and as far to the northward as Panian, another Dutch settlement, is the shoalest part of all the Malabar Coast, but no danger, there being gradual soundings to the shore. You have 6 or 7 fathom $1\frac{1}{2}$ or 2 miles off shore; 12 or 14 fathom, 3 or $3\frac{1}{2}$ leagues off; and 22 or 23 fathom, at 6 leagues distance,

distance, when you can but just see the land off deck. The bottom hereabouts muddy and ouzey.

As you sail along the coast you cannot see the town of Cochin, on account of the many Cochin. trees that are about it; so that it would be difficult to know it, but for its very high flag-staff, and large flag, which, being also erected on a very high tower, may be seen over the tops of the trees. This town and fort of Cochin is the chief settlement of the Dutch on the Malabar Coast, and is a place of great trade. It is situated on the south side the river, at the entrance, and lies in lat. 9 deg. 58 min. N. and long. 75 deg. Lat. &c. 55 min. E. from London. The variation, by several observations, in the year 1763, was 1 deg. 34 min. W. You may anchor in Cochin Road from $5\frac{1}{2}$ to $6\frac{1}{2}$ fathom, muddy Anchorage; ground; the flag-staff bearing E. N. E. or E. N. $\frac{1}{4}$ N. off shore $1\frac{1}{2}$ mile. Here you may get plenty of wood and water. Poultry and all kinds of refreshments are to be had in great plenty here.

Being in the offing, any where about Cochin, 6 or 8 leagues to the northward or Soundings southward of it, you will but just see the land off deck, in 22 or 23 fathom, or about in the offing. 6 leagues off shore. You have 16 fathom, 3 leagues off, with gradual soundings to the shore: all muddy ground, excepting as follows.

There is a shoal, with 4 fathom water on it, lies off the Dutch settlement Panian, or a Shoal off little to the northward thereof, in lat. 10 deg. 34 min. N. about 4 miles off the shore. Panian. Within this shoal there is $6\frac{1}{2}$ and 6 fathom within a mile, or a mile and a half, of the shore; and there is $9\frac{1}{2}$ or 10 fathom, a mile without it, muddy ground; and 14 fathom, a mile and a half or 2 miles without it. His Majesty's ships Weymouth and Cumberland were on this shoal in the year 1758: the Weymouth had 4 fathom water on it; and the Cumberland, missing stays, anchored on it in 5 fathom water, and sounded well about it. The Weymouth anchored a mile without it, in $9\frac{1}{2}$ fathom water, and also sounded well about this shoal. Mr. Benjamin White, master of the Weymouth, whose judgement and veracity I am sure may be relied on, gave me this account of the said shoal, and found the soundings as above mentioned. This shoal is but small, and we do not know that there is any less than 4 fathom water on it: but it is alarming to come suddenly, in the space of a mile, from 11 or 12, into 4 fathom; therefore great ships should keep out in 13 or 14 fathom hereabouts, in order to keep clear of this shoal, and to prevent their being surprized by coming too suddenly into shoal water.

From Cochin to Calicut the coast lies N. N. W. a little northerly, distance 30 leagues. From Cochin to Calicut. The land near the sea is low and woody, but clear of danger. As you come near Calicut, if the weather is clear, you may see, a great way in land, exceeding high mountains: these are part of the great chain of mountains which extend from Cape Comaroon, and run a great way further to the northward, called the Mountains of Gatta. You may coast it along from Cochin to Calicut in 8, 9, or 10 fathom, muddy ground, at $2\frac{1}{2}$ or 3 miles off shore, to 12, 13, and 15 fathom, from 4 to 6 or 8 miles off shore; and you will have 20, 25, and 30 fathom, from 4 to 5 and 6 leagues off shore. Calicut may be known by many little hills near the sea, and very high mountains in land: there are also several little pagodas near the shore, which appear very white. Here the English, French, Danes, and Portuguese, have each a factory-house, whereon they hoist their flags. This is a place of considerable trade, which consists in pepper, timber, and cardamums. The latitude of Calicut is 11 deg. 21 min. N. and long. 75 deg. 30 min. E. from London. Lat. &c. The variation, by several observations, in the year 1763, was 30 min. E. You may anchor in Calicut Road in $5\frac{1}{2}$ or 5 fathom, soft muddy ground, off shore about 2 Anchorage; miles; and the tombs to the northward of the town bearing E. N. E. or E. N. E. $\frac{1}{4}$ N. When Calicut bears east about 6 miles, you have 15 or 16 fathom; and when the English flag-staff bears N. E. by E. about 2 miles, there is a shoal with $\frac{1}{4}$ less 3 fathom,

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- A Shoal.** 3 fathom, hard, rocky ground, which extends N. N. W. and S. S. E. about a large quarter of a mile, and its breadth is little more than 2 ships lengths, and has 5 fathom just without.
- From Calicut to the Sacrifice Rock.** From Calicut Road to the Sacrifice Rock the course is N. W. by W. distance 6 leagues. This island or rock is about as high as a large ship's hull out of the water, and steep to on all sides. It lies about 3 leagues from the continent, and is very white, being covered all over with bird's dung. Its latitude is 11 deg. 36 min. N. and the variation, 1763, was 14 min. W. I never was through between this island and the main, but have seen ships go through, and been informed by those on board them, that there is a good channel with no less than 8 or 9 fathom, clear ground, and regular soundings. By going within-
- Soundings.** side this rock you make a shorter cut to Tillecherry. You have soundings from Calicut to the Sacrifice Rock from 6 or 7 fathom to 14, 15, 16, and 17 fathom, $1\frac{1}{2}$ mile without the rock; and 24 or 25 fathom about 4 or 5 miles off it. In the night, or hazy weather, I would advise you not to come under 20 fathom, but keep in 20 or 22 fathom, which will carry you clear of all danger.
- From Sacrifice Rock to Tillecherry.** From Sacrifice Rock to Tillecherry the course is N. $\frac{3}{4}$ W. distance 7 leagues. Being in 17 fathom water, $1\frac{1}{2}$ or 2 miles without the rock, you will have very regular soundings between that and Tillecherry from 17 to $5\frac{1}{2}$ fathom, ouzey ground. You may anchor in $5\frac{1}{2}$ or 5 fathom, the flag-staff at Tillecherry bearing N. E. by N. Green Island (a pretty high island, covered with trees) N. by W. $\frac{3}{4}$ W. off shore $1\frac{1}{2}$ or $1\frac{3}{4}$ mile. There are several great rocks to the northward of the town, but no danger, as they are close in shore. Tillecherry is an English settlement, in lat. 11 deg. 50 min. N. and long. 75 deg. 25 min. E. from London: the variation, 1763, by several observations, was 1 deg. W. Here may be had good fresh water, and other refreshments.
- Mahe.** About 2 leagues to the southward of Tillecherry stood the forts and town of Mahe, which was the chief settlement belonging to the French, on the Malabar Coast. They had built the town and forts, and made it a strong place. The principal fort was situated on a bluff point, at the mouth of a little river, which is navigable for only small country vessels: there were 2 other forts, both built on hills. This place
- Anchorage.** was taken by the English in Feb. 1760, and destroyed. The best anchoring in Mahe Road, in fine weather, was in 5 or 6 fathom; the flag-staff E. by N. or E. by N. $\frac{1}{2}$ N. $1\frac{1}{2}$ or 2 miles off shore.
- The Coast between Calicut and Tillecherry is low, and covered with wood; but there are several high hills a small distance in land, and very high mountains a great way in land.
- From Tillecherry to Mount Dilla.** From Tillecherry to Mount Dilla the coast lies N. W. $\frac{1}{4}$ N. distance $7\frac{1}{2}$ leagues, and is low and woody; but high hills are seen in land. You may coast it between them in from 10 to 14 or 15 fathom, from 4 to 6 miles off shore; but off Mount Dilla, in 14 or 15 fathom, you will not be more than 3 or 4 miles off shore. I have passed it in 10, 11, or 12 fathom, 2 or 3 miles off it. The soundings off it are very regular. In the offing between Tillecherry and Mount Dilla you have soundings from 20 to 26 fathom, ouzey ground, from 4 to 5 leagues off shore; and from 25 to 30 and 35 fathom, from 5 to 6 or 7 leagues off shore. When Mount Dilla bears from E. by N. to S. E. by E. distance 6 or 7 leagues, you have 31, 32, or 33 fathom, sandy ground.
- Cananore.** About 3 leagues to the northward of Tillecherry is the Dutch settlement of Cananore.
- Mount Dilla.** Mount Dilla is a high mountain, lying E. N. E. and W. S. W. and forms a point of land that projects into the sea. The French had a small fort on the outer part of it, next the sea, which may be seen as you pass it. Coming from the northward or southward it appears separate from the coast, the land within it, and on each side of it, being very

very low; so that at a distance it appears like an island, which renders it very remarkable to navigators. The latitude of Mount Dilla is 12 deg. 6 min. N. the variation off it, Lat. &c. 1763, 34 min. E. It may be seen 9 or 10 leagues in clear weather.

From Mount Dilla to Mangalore, the coast lies N. N. W. distance 16 leagues, and still continues low and woody, as well as clear of all danger. About 5 or 6 leagues to the northward of Mount Dilla, and some distance in land, there is a high hill, called Mount Formosa; and about 6 leagues to the northward thereof is a long, high, sloping hill, called Barn Hill, with several other hills further in land. You may stand in shore to 7 or 8 fathom with safety, and coast it in 9 or 10 fathom, at 5 or 6 miles distance. In the offing between them you will have 16 fathom, $2\frac{1}{2}$ leagues off shore; and from 27 to 30 fathom, ouzey ground, from 5 to 6 leagues off shore. Mangalore bearing E. $\frac{1}{2}$ N. and Barn Hill E. S. E. off shore $4\frac{1}{2}$ or 5 leagues, you will have 21 or 22 fathom; and Barn Hill E. by S. $\frac{1}{2}$ S. and Mangalore east, off shore about 6 leagues, you will have 30 fathom, sand and ouze.

Mangalore, a place of great trade for rice, is situated at the mouth of a river navigable only for small ships, as it has a bar. On the south side of this river there is a fort, belonging to the Portuguese, where they hoist their colours, which may be seen a great way at sea. The anchorage in the road is opposite the river in 5, 6, or 7 fathom, soft muddy ground. The latitude of this place is 12 deg. 50 min. N. I made the variation, 1763, 37 min. W. Hereabouts the land is pretty high.

From Mangalore to Annanore the coast lies N. N. W. 31 leagues. A little to the northward of Mangalore the coast begins to be very high. About 8 or 9 leagues to the northward of Mangalore there is a Moors settlement, called Bassalore, at the back of which is a very high mountain, with a remarkable peak, called the Peak of Bassalore. It continues high and mountainous a great way to the northward of Annanore; but this high land is not close to the sea, though at a distance it appears so; for the coast near the sea is low and woody, with regular soundings towards the shore, and continues so to that part opposite Pigeon Island, which bears from Mangalore N. N. W. $\frac{1}{2}$ W. 28 leagues. Between Mount Dilla and Pigeon Island you have soundings further off the land than any other part of the coast, having from 30 to 40, 50, and 56 fathom, fine sand, from 7 to 10, 12, or 14 leagues off shore; very regular soundings.

From Cape Comaroon to Mangalore is the proper Coast of Malabar, and from thence to Bombay the Coast of Canara; but people in general call the whole by the name of the Malabar Coast.

The Permira Rocks bear from Mangalore N. W. by N. 10 or 11 leagues: they lie 3 or $3\frac{1}{2}$ leagues off shore, in lat. 13 deg. 17 min. N. they are as high as a small ship's hull out of the water, and may be seen $3\frac{1}{2}$ or 4 leagues from a ship's deck. Come no nearer these rocks, in the night or hazey weather, than 18 fathom. I have sounded well about these rocks, and have passed them in $16\frac{3}{4}$, $16\frac{1}{2}$, 16, $15\frac{1}{2}$ fathom, at 2 or $2\frac{1}{2}$ miles distance without them; and you will have no less water close to them: the soundings are regular and even, sand and ouze. You have 17 fathom, 3 miles without these rocks; 18 $\frac{1}{4}$ fathom, about 4 miles without them; and 20 or 21 fathom, 5 or 6 miles without them; and then you will be 5 or 6 leagues off shore. The variation off these rocks, 1763, was 28 min. W.

The St. Mary's Rocks are several little islands or rocks, lying $2\frac{1}{2}$ or 3 leagues off shore, in lat. 13 deg. 30 min. N. some of which are as high as the hull of a small ship, others low and flat: they bear N. N. W. 4 or 5 leagues from the Permira Rocks, and may be seen 3 or $3\frac{1}{2}$ leagues from a ship's deck. You have $15\frac{1}{2}$ or 16 fathom, 2 or 3 miles without these rocks. I would not advise you to come nearer them than 16 fathom, and in the night, or hazey weather, than 17 or 18 fathom, in which depth you will pass 4 or 5 miles.

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5 miles without them. You have 21, 22, or 23 fathom, 6, 7, or 8 miles without them; when you will be 5 or 6 leagues off shore. The variation, 1763, 43 min. W. From St. Mary's Rocks to Pigeon Island you have regular soundings towards the shore, viz. from 10 to 12 fathom, 4 or 5 miles off shore; 15 or 16 fathom, 3 leagues off; 19 or 20 fathom, 4 leagues off; 24 or 25 fathom, 5 leagues off; and 30 to 33 fathom, 6 or 7 leagues off: very regular soundings, and ouzey, clear ground.

Pigeon I. Pigeon Island is a small, but very high, round island, which may be seen 9 or 10 leagues in clear weather. It lies about 3 leagues from the continent, in lat. 14 deg. 4 min. N. and has a little island or rock to the south-eastward, and another to the eastward of it. The variation, 1763, by several observations, was 1 deg. 2 min. W.

Hog Island. From Pigeon Island, E. $\frac{1}{2}$ S. 2 $\frac{1}{2}$ leagues, lies a small, but very high island, with a peak much like the top of a sugar-loaf, called Hog Island. It lies near the continent, with several small islands or rocks near it, but has gradual soundings towards them from 8 or 9 fathom.

Between Pigeon I. & Hog I. The continent hereabouts is very high and mountainous. You may with great safety go between Pigeon Island and Hog Island. I have gone this passage several times when bound to Annanore. You have 16 or 17 fathom, mid-channel, to 11, 10, or 9 fathom, on the continent side. When to the northward of Hog Island, you may coast it along to Annanore Road, in 8, 9, or 7 fathom, 3 or 4 miles off shore, without danger.

Annanore. In Annanore Road you may anchor in from 5 to 6 fathom, soft muddy ground; the flag-staff at Annanore bearing E. by N. or E. N. E. Fortified Island N. by W. off shore 1 $\frac{1}{2}$ or 2 miles; and Pigeon Island S. by W. 3 $\frac{1}{2}$ or 4 leagues. This is a considerable Indian town, situated at the mouth of a salt-water river, where the English have a factory, and is noted for producing great quantities of rice and pepper: its latitude is 14 deg. 14 min. N. The variation off this place, 1763, 1 deg. 16 min. W. There is no fresh water to be had here. About 1 $\frac{1}{2}$ mile to the northward of Annanore is a high green island, level at top, a small distance from the continent, which has an Indian fortification on it; wherefore it is called Fortification Island.

Soundings without Pigeon Island. In the stream of Pigeon Island you have 20 and 21 fathom. I have passed without this island several times, within 3 or 4 miles of it, bearing from E. by S. to E. by N. and had 24, 24 $\frac{1}{2}$, and 25 fathom. In the night, or hazy weather, a ship should not come nearer than this depth. You will have 30, 32, or 34 fathom, 3 or 4 leagues without it, when you are 6 or 7 leagues off shore: regular soundings, sand and ouze.

Anjedive I. From Annanore N. W. by N. 15 or 16 leagues, lie the Island Anjedive, and the Duckey or Oyfter Rocks, from Pigeon Island N. by W. 17 leagues, and from Cape Raymas S. E. by S. about 5 leagues. They lie in lat. 14 deg. 55 min. N. at the entrance into Carwar, which is a large and deep bay. The settlement of Carwar, which formerly belonged to the English, but now to the Portuguese, is on the north side of the bay: the fort is situated on a high point of land, and is very white, which makes it very conspicuous a great way at sea. When the fort at Carwar and the Duckey Rocks are in one, E. N. E. $\frac{1}{4}$ E. distance off shore 3 leagues, and from the rocks 7 or 8 miles, and Cape Raymas N. $\frac{1}{2}$ W. you have 16 and 17 fathom. In the offing, in 19 and 20 fathom, you will be 3 $\frac{1}{2}$ or 4 leagues off shore. You have 25, to 28 or 30 fathom, from 5 to 7 leagues off shore, sandy ground. Between the Duckey Rocks and Cape Raymas you have 14, 15, and 16 fathom, from 5 to 7 miles off shore.

C. Raymas. From Annanore to Cape Raymas, the coast lies N. N. W. $\frac{3}{4}$ W. distance 21 leagues; and from Pigeon Island, N. by W. $\frac{3}{4}$ W. 22 leagues. It is high and mountainous, but bold to, and clear of all danger. Cape Raymas, coming either from the northward or southward, shews itself a very high, steep, bluff head-land, and has, on the top thereof,

an Indian fortification. It lies in lat. 15 deg. 7 min. N. The variation off it, in 1763, was 1 deg. 26 min. W. I have passed within 2 miles of this cape in 11 $\frac{1}{2}$ and 12 fathom, regular soundings, sandy bottom. When it bears from E. by S. to E. by N. 3 or 4 miles distance, you have from 14 to 15 $\frac{1}{2}$ fathom: and 5 miles off this cape you have 16 and 16 $\frac{1}{2}$ fathom; likewise 5, 6, or 7 leagues off, you have 30, 36, to 45 fathom; from which depth to the shore it shoalens gradually. From Pigeon Island to Cape Raymas you have 10, 11, 12, or 13 fathom, from 2 to 3 leagues off shore. There is a high rock, some distance from the shore, off a point a little to the northward of Cape Raymas.

From Cape Raymas to Goa the coast lies N. by W. distance 8 leagues. The land From Cape Raymas to Goa. between them, near the sea, is low and woody; but at some distance in land it is high. This part of the coast is clear from danger: you may coast it along shore, as far as St. George's Island, in from 13 to 12, 11, or 10 fathom, regular soundings, sand and ouze; but attempt not to go between St. George's Island and the Continent, there being no passage that way. From Cape Raymas to the outer part of St. George's Island the course is N. N. W. $\frac{1}{2}$ W. distance 6 or 6 $\frac{1}{2}$ leagues. You have soundings between them, 2 $\frac{1}{2}$ or 3 leagues off shore, from 17 to 18 fathom. I have passed several times, within 3 or 4 miles of St. George's Island, in 15 and 15 $\frac{1}{2}$ fathom, regular soundings, sandy bottom: this was in the day time; but in the night, or hazy weather, I would not advise you to go into less than 18 or 19 fathom; in which depth you will pass 5 or 6 miles without it, clear of all danger. You have from 25 to 30, and 35 to 40 fathom, from 4 to 6 or 7 leagues without this island. Its latitude is 15 deg. 23 min. N. It may be seen 6 or 7 leagues in clear weather. A little to the northward of St. George's Island lies the Island Marmagon St. George's Island. Salfet, being a long, high, but level island, breaking off almost perpendicular at both ends; the north point of which is called Marmagon Point. When this point and the north part of St. George's Island are in one, or touching, they bear N. N. E. and from this point the Alguarda Fort, at the north side of the entrance into Goa, bears N. $\frac{3}{4}$ E. distance 7 or 8 miles: you have soundings between them from 16 to 14, 12, 10, 9, 8, 7, 6, 5 $\frac{1}{2}$ fathom; in which depth you may anchor in Goa Road. From the outer part of St. George's Island, to the head-land on the north side the entrance into Goa Bay, which is a high table land, and breaks off with a sudden slope towards the sea, the course is N. $\frac{1}{2}$ E. distance 3 or 4 $\frac{1}{2}$ leagues.

This head-land, being high and level at top, is easy to be known, there being a church Goa Road or Bay. on the inner, and a light-house on the outer part of it, in which the Portuguese keep a light, during the S. W. monsoon. The latitude of this head-land is 15 deg. 31 min. N. by astronomical observation, and longitude 73 deg. 52 min. E. from London; the variation, by several observations, 1763, 1 deg. 50 min. W. Near the light-house there is a small fort, which has a line of communication to the Alguarda Fort, situated at the foot of the Alguarda Fort. said high land close to the sea, which has a great number of guns, and commands all the Bay of Goa. In this fort is the watering-place where ships get all their water. Opposite to the Alguarda Fort is the monastery Nostra Seínora de la Caba, situate on a high, steep point of land, which makes the south side of Goa Bay: this being a large building, and kept very white, together with its elevated situation, makes it very conspicuous, and occasions its being seen a great way at sea; and by which Goa may be easily known. St. George's island is also a good mark to know when you are the length of Goa. The Bay of Goa is large and round, but very shallow water all over it: the deepest water is on the north side; and there you have no more than 5 $\frac{1}{2}$ or 5 fathom at high, and 4 $\frac{1}{2}$ or 4 $\frac{1}{4}$ at low water; soft, muddy bottom. It is not only shallow, but rocky, on the south side the bay, towards Nostra Seínora de la Caba, from which there runs out a reef of rocks above water, and under water; therefore should be avoided. This bay is a very good road, where ships

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may lie in great safety during the N. E. monsoon; but in the S. W. monsoon they are exposed to both wind and sea, which then rage with great violence.

In the beginning, or towards the middle of May, it is reckoned dangerous for ships to lie in this bay. The Portuguese then send such of their ships as can go, into the river, where they lie all the monsoon in great safety: and such as cannot get into the river, go and lie for the monsoon at Marmagon Salfet: they moor close under that island, where they are sheltered from the S. S. W. W. and W. N. W. winds, which are the prevailing winds in that monsoon, and are pretty well sheltered from the sea; though there sometimes rolls in a pretty large swell to the road where they lie: this is called Marmagon Road, it being the only place the Portuguese have for their great ships to lie in, during the bad-weather season: the ground is clear, and good anchorage.

If bound in-
to Goa. If, coming from the southward, you are bound into Goa, being off Marmagon Point in about 15 fathom, steer to the northward till you bring the head-land on the north side of Goa Bay to bear N. E. or the flag-staff at the Alguarda Fort E. N. E. in order to avoid a dangerous shoal of rocks, that lie under water $\frac{1}{2}$ of the way between Marmagon Point and the Monastery of Nossa Senhora de la Caba. You may steer in for Goa with the Alguarda flag-staff E. N. E. or E. by N. having gradual soundings from 15, 14, 12, 11, 10, 9, 8, 7, 6, 5 $\frac{1}{2}$ fathom, in which depth you may anchor in Goa Road; or in $\frac{1}{2}$ less 5 fathom, the flag-staff at the Alguarda Fort N. N. E. the Monastery of Nossa Senhora de la Caba S. E. and the outer point on the north side the bay N. by W. distance off shore $\frac{3}{4}$ or 1 mile. You may anchor still further in, and nearer the Alguarda Fort, in 4 $\frac{1}{2}$ fathom; the flag-staff bearing N. by E. or N. distance $\frac{1}{2}$ or $\frac{3}{4}$ of a mile; and the entrance into Goa River E. by N. or E. by N. $\frac{1}{4}$ N. I have anchored in a seventy-gun ship, in a very convenient birth for watering with dispatch, the Alguarda Fort N. 10 deg. W. distance a large half or three quarters of a mile, the monastery Nossa Senhora de la Caba S. 31 deg. 30 min. E. the entrance of Goa River E. 20 deg. 30 min. N. and had 5 fathom at high, and 4 $\frac{1}{4}$ at low water. This is a good birth.

Anchorage.

At the N. E. side of Goa Bay is the entrance of a very large river, navigable for ships of 500 or 600 tons, that can go quite up to the city of Goa, which is 7 miles up the river; but this river is difficult of access, having a bar across its mouth, which makes the navigation into it very intricate; and therefore must have a pilot of the place to carry the ship in and out: on this bar there is 16 or 17 feet at high-water, on spring-tides. The Portuguese have a fort on the north side the entrance of this river, on a high hill; and a low battery on the south side the river; both of which a ship must go very close to in entering the river.

The tide.

The tide here flows, at full and change, E. N. E. and W. S. W. or at $\frac{1}{2}$ past 4 o'clock; but always sets out of the river, though it ebbs and flows regularly about 6 feet perpendicular by the shore. In the bay the flood is a kind of still water; for the tide has no motion whilst it is flowing, which is about 4 hours; and from the time of high-water it sets pretty strong out of the bay for 7 or 8 hours.

Goa.

Goa is the chief settlement belonging to the Portuguese in India. It is a large and spacious city, situated on the south side of a spacious river, which it gives name to, 7 miles above its entrance: it is very populous, and the residence of a vice-roy. There is a considerable trade carried on at this place, but not so great as formerly: it is famous for making Goa arrack, in which its trade now principally consists. There are many ships belong to this place, it being the general rendezvous of the Portuguese men of war, and all their cruizers, of which they have a great number. They have convenient places up the river for heaving ships down, and repairing them, at which they are very dexterous. They also build many ships here, having plenty of timber for the purpose. Naval stores of all kinds may be had here.

Wood and water may be got here in plenty: the watering-place is in the Alguarda Fort, where the water is conducted down to your boats in spouts, to which you fix a hose, and fill your casks with great ease and dispatch.

Fresh provisions, vegetables, and fruits, may be got here; and also some sea-provisions, such as rice, callivances, arrack, sugar, and some flour.

Off Goa you have 9 or 10 fathom, 3 or 4 miles without the Alguarda Fort; and from 22 to 24 fathom, 3 or 4 leagues off; and from 30 to 35 fathom, 5 or 6 leagues off; and from 60 to 62 fathom, 9 or 10 leagues off; and a little without that, 90 fathom; in which depth you can but just discern the land; all ouzey ground.

From Goa to the Vingorla Rocks the course is N. W. by N. distance 12 leagues, and is pretty high and bold, clear from all danger; the outermost part of these rocks bearing from Vingorla River, W. S. W. 4 leagues; and 3 or 3 $\frac{1}{2}$ leagues from the continent: they are 12 or 14 in number, and may be seen about 5 leagues from a ship's deck; lying in lat. 16 deg. N. It is said that there is a passage between these rocks and the continent; but I have always failed without them. You may coast it along from Goa in 10, 11, or 12 fathom, from 4 to 6 miles off shore. You have 15 and 16 fathom 3 leagues off shore; and 20, 25, 30 to 35 fathom, from 4 to 6 leagues off shore. I have passed within 2 or 3 miles of these rocks in 17 $\frac{1}{2}$ fathom; and when they bore east 5 or 6 miles, I have had 18 fathom, by which I imagine they are steep to: you have from 30 to 35 fathom 5 leagues off, when they can but just be seen from a large ship's poop, ouzey ground. I would advise you, if passing these rocks in the night-time or hazy weather, not to go under 20 fathom, which will carry you 2 $\frac{1}{2}$ or 3 leagues without them. There is a good road to the southward of these rocks, where a ship may anchor in case the wind blows hard at N. W. by bringing the outermost rock to bear W. N. W. or W. by N. and the extremes of the land to the southward, S. E. in 12, 13, or 14 fathom, clear, muddy ground. Here you will lie in very smooth water, and well sheltered from the N. W. sea. In the River Vingorla there is a nest of pirates, who are always on the look-out: they have a great number of gallivats and some grabs, cruizing about the Vingorla Rocks, and take ships of all nations that they can conquer; which makes it dangerous for ships of little or no force to come near this place: they therefore keep in the offing, out of sight of land, unless they have a convoy.

From the outermost of the Vingorla Rocks to Gariah or Garey, the course is N. by W. distance 13 leagues: the coast between them is pretty high, and clear of all danger. You may coast it between them in from 13 to 14 fathom 4 or 5 miles off shore, to 20 or 21 fathom 3 or 3 $\frac{1}{2}$ leagues off shore. You have 25 and 26 fathom 5 leagues off shore; and from 30 to 33 fathom 6 or 7 leagues off shore; regular soundings and ouzey ground.

Gariah lies from Goa N. N. W. distance 23 leagues, and is situated on Point Vigia, which makes the south point of Gariah Bay: this is a high bluff point, whereon is a strong fort, with very high walls and a great number of guns. This place formerly belonged to Angria, and was his principal port; but now belongs to the Marattas. The flag-staff at Gariah is very high, and may be seen a great way at sea. Its latitude is 16 deg. 36 min. N. the variation off this place, 1763, 1 deg. 16 min. W. When the flag-staff bears E. by S. 2 or 3 miles, you have 11 or 12 fathom; E. $\frac{1}{2}$ S. 6 or 7 miles, 15 $\frac{1}{2}$ or 16 fathom; from E. by N. to E. by S. 3 $\frac{1}{2}$ leagues, 20 fathom; and with the same bearings 6 or 7 leagues, from 30 to 33 fathom, ouzey ground.

From Gariah to Rogipore Island the coast lies N. N. W. distance 10 leagues: this is a small but high island, covered with trees, and lies but a small distance off the continent, and 3 or 4 miles to the southward of Rogipore River. Its latitude is 17 deg. 3 min. N. The river has a wide entrance like a large bay, with pretty high land on each side it.

From

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From Gariah to Rogipore the coast is tolerably high, bold, and clear of danger. You may coast it along between them in from 14 to 16 and 17 fathom, from 4 to 6 miles off shore. You have from 20 to 25 fathom, 4 or 5 leagues off shore; and from 25 to 30 and 35 fathom, 6, 7, and 8 leagues off shore, muddy ground.

Cape Dobs. N. N. W. 7 leagues from Rogipore Island, lies Cape Dobs, in lat. 17 deg. 23 min. N. being a high bluff head-land, shooting out into the sea: the coast between them is clear of all danger, and bold to. You may stand in to 9 or 10 fathom, 2 or 3 miles off shore; and coast it along in 12 or 13 fathom, 5 or 6 miles off shore. You have 16 fathom, 3 leagues off shore; 20 fathom, 4 leagues off; and from 36 to 40 fathom, 7 or 8 leagues off the land hereabouts; sand and ouze.

Cape Z. From Cape Dobs the coast lies N. N. W. 5 leagues to Cape Z. in lat. 17 deg. 37 min. N. The variation, 1762, was 44 min. W. This is a high, steep, red, head-land, lying out a small distance into the sea: it appears very white when the sun shines on it, which, with its being high and steep, makes it very remarkable. Between these capes the coast is high and bold to; and there are several openings, like the entrance into the rivers or harbours; and when near the shore, you may see several Indian fortifications, which I can give no particular description of; but am well assured that the coast is clear of all danger. I have coasted it several times close in shore. You may stand in to 8 or 9 fathom with safety, $1\frac{1}{2}$ or 2 miles off shore; and you may coast it along in 11, 12, or 13 fathom, from 2 to 3 leagues off shore. You have from 17 to 20 fathom, 4 or 5 leagues off; and 25 to 30 fathom, 6 or 7 leagues off shore; sand, mud, and ouze.

Dabull. From Cape Z. to Dabull the coast lies N. N. W. distance 7 leagues. The land hereabouts is high near the sea, but very much higher in land. The coast is bold and clear from danger. You may stand in to 8 or 9 fathom, $1\frac{1}{2}$ or 2 miles off shore; and may coast it along in 12 or 13 fathom, 4, 5, or 6 miles off shore. You have from 17 to 20 fathom, 4 or 5 leagues off; from 25 to 30 fathom, 6 or 7 leagues off; and from 35 to 40 and 45 fathom, 8, 9, or 10 leagues off shore: sand and ouze in the offing; in shore, muddy ground. Here the English have lately established a factory, and built a fort called

Fort Victory. which stands on a high hill near the sea, so that their flag may be seen a great way. Its latitude is 17 deg. 56 min. N. and the variation, 1763, was 25 min. W. **Anchorage.** To anchor in the road, bring the fort to bear E. $\frac{1}{2}$ S. and the extremes of land from N. $\frac{1}{4}$ W. to S. S. E. where you have 7 fathom water, 2 miles off shore. You have 7 or 8 fathom, $2\frac{1}{2}$ or 3 miles off; 11 or 12 fathom, 5 or 6 miles off; 17 or 18 fathom, $3\frac{1}{2}$ or 4 leagues off; 20 fathom, 5 leagues off; and 25 to 30 fathom, 7 or 8 leagues off Fort Victory.

Dunde-Rogipore. From Fort Victory to the harbour and river of Dunde-Rogipore the coast lies N. N. W. distance 8 leagues, being high and clear from danger. The land in the country is mountainous, and may be seen a great way in clear weather. You may stand in to 8 or 9 fathom, muddy ground, 2 miles off shore; and coast it along in 11 or 12 fathom, 2 or $2\frac{1}{2}$ leagues off shore. You have 20 and 22 fathom, 5 or 6 leagues off; 25 to 30 fathom, 7 or 8 leagues off; and from 35 to 40 fathom, 9 or 10 leagues off shore, ouzey ground; sometimes sand without ouze; but you will have it muddy in shore from 15 to 7 fathom. Dunde-Rogipore is reported to be a very fine harbour, fit to receive ships of any size: it has a large and wide opening to the sea, with a small island near the north side of the entrance, and high land on both sides. Its latitude is 18 deg. 17 min. N. and the variation, 1763, 25 min. W.

Choul. From the entrance into Dunde-Rogipore, N. N. W. $\frac{1}{2}$ W. distance 7 leagues, lies a small, low, and flat island, with an Indian fortification on it, called Choul Island, from its lying off the town of Choul, in lat. 18 deg. 36 min. N. The town of Choul is large and

and considerable, as an Indian town; with a fort built on a little eminence, that may be seen 4 or 5 leagues at sea. The coast between these places is foul and rocky some distance from the shore: I would not advise you to stand in shore hereabouts nearer than 8 or 9 fathom; though I have always found the soundings very regular, and muddy bottom. In sailing along this part of the coast you see many buildings. Near the sea is the high land, called the High Land of Choul; and in land are many high and rugged mountains. Off Choul there are many fishing-stakes in 7 or 8 fathom, 2 or 3 leagues off shore: I have several times sailed through them. There are regular tides off this part of the coast, where it flows N. and S. or at 12 o'clock, at the full and change of the moon; the flood to the northward, and the ebb to the southward, pretty strong tides, which you are to observe, and make advantage of. You have 8 or 9 fathom, 4 miles off Choul, and may coast it along shore from Dundee-Rogipore in 10 or 11 fathom, $2\frac{1}{2}$ or 3 leagues off shore: you have from 16 to 18 fathom, 4 or 5 leagues off; from 20 to 26 fathom, 6 or 7 leagues off; from 30 to 36 and 40 fathom, 8, 9, or 10 leagues off shore; mud, sand, and ouzey ground.

From Choul Island you will plainly see the Islands Hunary and Kanary: the latter is Hunary and the outermost. From Choul Island to the Island Kanary the course is N. W. distance $4\frac{1}{2}$ leagues: between them you may keep in 8, 9, or 10 fathom water, and no danger. Ships do not go between these islands, as the channel is narrow, though I have sounded well between them, and found 3 and $3\frac{1}{2}$ fathom. You may pass to the westward of Kanary in 6 or 7 fathom, 3 or 4 miles off it; you have $4\frac{1}{2}$ or 5 fathom within a mile of it; 11 or 12, to 15, 16, or 18 fathom, from 3 to 4 or 5 leagues off it; 34 to 36 fathom, to 8 or 9 leagues off it; and 40 to 45 fathom, 10, 11, or 12 leagues off it. The latitude of Kanary is 18 deg. 45 min. N. The variation off it, 1763, was 1 deg. 39 min. W. When this island is first seen, or about 5 leagues distance, either from the northward or southward, it appears like 2 rocks, or islands, a small distance asunder, being higher at the extremities than in the middle; by which it may be known; and it is fortified all round after the Indian method.

From Kanary you may see Old Woman's Island just rising out of the water, the outer part thereof bearing N. $\frac{1}{2}$ E. distance 11 miles. You have 7, 8, 9, 10, and $10\frac{1}{2}$ fathom, regular soundings, between them; muddy bottom. As I have already given a full description of Bombay Harbour, and places adjacent, I shall therefore omit mentioning any thing further here, but refer you to that in page 23 to 30.

There lies a bank parallel to the coast, of about 11 or 12 leagues in length, and 3 in breadth; the southernmost part being in 18 deg. 6 min. N. and the northernmost part in 18 deg. 43 min. N. I have had 23 fathom on the southernmost part of this bank, 28 fathom without it, and 27 within it, off shore 7 or 8 leagues. In lat. 18 deg. 16 min. N. I have had 30 fathom without it, 25 fathom upon it, and 29 fathom within it, off shore 8 or 9 leagues, sandy ground. In lat. 18 deg. 28 min. N. I have had 30 fathom without it, 26 fathom upon it, and 32 fathom within it, off shore 6 or 7 leagues, sandy ground. In lat. 18 deg. 43 min. N. or the northernmost part of this bank, I have had 36 fathom without it, 32 fathom upon it, and 37 fathom within it, off shore 8 or 9 leagues, sandy ground. I have been informed by some navigators, that on some parts of this bank they have had only 16 fathom, gravelly, shingley bottom, 9 or 10 leagues off the coast: however true that may be, I know not, but am well satisfied my own remarks of it are just and true, and may be of great use to ships coming in with this part of the coast in the night-time, or hazey weather. You have soundings near 20 leagues off this part of the coast, which shoalen gradually as you run in for the coast.



Instructions for sailing from Bombay, or Surat, for China, through the Straits of Malacca.

THE usual time for ships that are bound to China, to sail from Bombay or Surat, is in April, or early in May. You may coast it along the Malabar Coast at a reasonable distance, in sight thereof, or in soundings. The best way is to keep a good offing in May, as the winds then hang pretty much to the westward, and are often to the southward of the west. You may take your departure from Cape Comaroon, whose latitude, &c. you have in p. 98. from whence ships make about 16 deg. E. long. to Pulo Rondo, or 14 $\frac{1}{4}$ deg. to the S. W. part of the Niccobars. But I would steer from Cape Comaroon for Point de Gall, and take my departure from thence for Pulo Rondo, which bears due east from Point de Gall, whose latitude, &c. you have in p. 36. Ships usually make about 13 $\frac{1}{4}$ deg. E. long. between them. Ships that take their departure from the Great Bassas make about 10 $\frac{1}{4}$ deg. to the S. W. part of the Niccobars, or 11 $\frac{1}{4}$ deg. to Pulo Rondo.

In crossing the Bay of Bengal you are to observe, that there is a constant northerly current during the S. W. monsoon, and a southerly or S. W. current in the N. E. monsoon, which you must make an allowance for in the course steered.

Having made Pulo Rondo, &c. proceed according to the Directions in p. 68—81. for sailing through the Straits of Malacca to Pulo Sapata, and from Pulo Sapata to Canton in p. 88.



Some General Remarks on our Passage from Bombay to the Cape of Good Hope through the Inner Passage, or between Madagascar and the South-East Part of the Coast of Africa.

WE set sail from Bombay, Dec. 16, 1763, and steered along the Coast of Malabar, in soundings from 10 to 40 fathom, having moderate land and sea breezes, fair weather, and smooth water. As I have given a very particular description of this coast in a former chapter, I shall therefore avoid saying any thing further on it here; but only remark, that the winds hung much more to the southward than I ever knew them, blowing mostly from E. S. E. to S. S. W. and W. S. W. very uncommon winds on this coast in December.

From Calicut thro' the Nine-Degree Channel.

On the 30th we joined Admiral Cornish in his Majesty's ship Norfolk, in company with his Majesty's ships America and Chatham, off Calicut, from whence we took our departure, (allowing its lat. 11 deg. 21 min. N. and long. 75 deg. 30 min. E. from London) and sailed through the Nine-degree Channel, with moderate winds in the N. E. quarter.

quarter. The best latitude to keep in, steering through the Laccadive Islands, is 9 deg. 40 min. N. On the 1st of January, 1764, at noon, being in latitude, by observation, 9 deg. 49 min. N. and longitude, made from Calicut, 3 deg. 6 min. W. saw the Island Scuhelipar. Scuhelipar, from the mast-head, bearing N. by E. distance 6 or 7 leagues: this is a low, flat island. The variation was observed, A. M. 1 deg. 5 min. W. From thence steered to make the land to the northward of Cape Bassas, and met with nothing very remarkable, having steady moderate gales in the N. E. quarter, a smooth sea, and pleasant weather. As to the current, found little or none; sometimes a few miles to the northward, and at others as much to the southward, in the 24 hours, until we made the land.

On the 15th, at $\frac{1}{2}$ past 5 P. M. being then in latitude, by account, 6 deg. 47 min. N. Made the and longitude, made from Calicut, 24 deg. 2 min. W. the variation 10 deg. 29 min. W. East Coast saw the land of Africa from N. N. W. to W. $\frac{1}{2}$ S. distance 5 or 6 leagues: at the same of Africa. time sounded, and had 50 fathom, fine white sand. We steered a S. S. W. $\frac{1}{4}$ W. course all night, which carried us rather off the land: a S. W. by S. course, by compass, seems to be the along-shore course. The land hereabouts is pretty high, with white cliffs or sand-hills near the sea, which may be seen, in clear weather, 8 or 9 leagues, and seems to be pretty bold, and clear of danger. The variation, A. M. by several observations, was 10 deg. 38 min. W. At noon, the latitude, by observation, 4 deg. 49 min. N. and longitude, made from Calicut, 25 deg. 20 min. W. We this day found a current, which set the ship 19 miles to the southward of the reckoning. The 16th, at 6 P. M. Cape Bassas bore W. by S. $\frac{1}{4}$ S. the northernmost land in sight, N. distance off shore Cape Bassas. about 7 leagues; being then in latitude, by account, 4 deg. 15 min. N. and longitude, made from Calicut, 25 deg. 35 min. W. or 49 deg. 53 min. E. from London: the variation 10 deg. 43 min. W. The course and distance from the land we first made, in lat. 6 deg. 47 min. N. to Cape Bassas, is S. 25 deg. W. or S. S. W. $\frac{1}{4}$ W. about 57 leagues. This day found the current had set the ship 27 miles again to the southward of the reckoning. Took my departure from Cape Bassas in lat. 4 deg. 10 min. N. and long. by computation, 49 deg. 50 min. E. from London; and found the current along this coast generally setting to the southward, sometimes at the rate of 35 or 36 miles in the 24 hours. On the 18th, crossed the equator in longitude, made from Cape Bassas, 2 deg. 41 min. W. the variation 13 deg. 16 min. W.

On the 27th, at noon, saw the Coast of Mosambique very plain, from N. W. by W. Coast of to W. I imagine it to be very high land, as we were at least 14 or 15 leagues from it, Mosam- and saw only the tops of the hills, which appeared like islands. The latitude in, by bique. observation, 13 deg. 42 min. S. and longitude, made from Cape Bassas, 6 deg. 50 min. W. Mosambique bearing, by estimation, S. 38 deg. W. distance 34 leagues, had mostly moderate gales from the N. E. quarter, sometimes E. S. E. and sometimes N. N. W. with fair weather, the current still setting mostly to the southward. The variation increased to 17 deg. 4 min. W. Finding our reckoning from Cape Bassas to Mosambique pretty exact, took a fresh departure from Mosambique, supposing it to bear as by estimation at noon, and allowing its latitude 15 deg. 4 min. S. and longitude, by computation, 41 deg. 56 min. E. from London. The 28th, found the current had set the ship 40 miles to the southward of account in the last 24 hours. Had the winds from W. by N. to N. W. and N. N. E. with some squalls, thunder, lightening, and rain. The 29th, had fresh gales from N. and N. N. E. to E. N. E. and hazey weather, with some rain; and a large swell from the N. N. E. Found ourselves 59 miles to the southward of the reckoning: suppose this current sets S. W. The sun near our zenith. The 30th, had strong gales and squalls from N. to N. E. by N. with a large sea from the N. N. E. and thick hazey weather, with some rain. This day found ourselves 8 miles to the northward of account: latitude, by observation, 19 deg. 55 min. S. and longitude, made from Mosam- bique,

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bique, 41 min. W. The 31st, towards evening, had a great sea from the S. E. which thwarted that from the N. N. E. and made a very high confused sea. At midnight came on a violent hard gale of wind, with much rain. The wind from noon to midnight veered round gradually from N. by E. to N. E. by E. E. E. S. E. and S. E. when the gale was at the height: from midnight to noon the gale rather increased, and the wind veered from S. E. to S. S. E. We were lying under a reefed and balanced mizen, and mizen stay-sail, much distressed on account of the ship's being so leaky, that she gained upon all the pumps, and bailing at all the hatchways, with buckets, &c. At noon it blew very hard, with rain, and a great sea from the S. E. Latitude in, by account, 20 deg. 46 min. S. and longitude, made from Mosambique, 2 deg. 11 min. W. We here lost the N. E. trade. From this time to the 3d of February, had strong gales from S. to S. by E. S. by W. S. W. by S. S. W. and W. S. W. with cloudy weather, and frequent hard squalls with rain, and a very great sea from the S. E. This day we lost our rudder, which, together with the leaky condition of our ship, made us really in a distressed condition. Latitude in, by observation, 19 deg. 52 min. S. and longitude, made from Mosambique, 1 deg. 7 min. W. Found we were set 60 miles to the southward of the reckoning, since the last observation. From the 3d to the 8th, had the winds from W. S. W. W. by S. S. W. by W. to S. by W. S. by E. and S. mostly fresh gales and cloudy weather, with frequent squalls and rain, and a large swell from the southward. Found the current, for these last 5 days, had set the ship to the southward of the reckoning, at the rate of 31 miles a day. This day got a machine over-board, and steered the ship with it, instead of a rudder. Latitude in, by observation, 21 deg. 45 min. S. and longitude, made 35 min. E. from Mosambique: the variation 24 deg. 32 min. W. The next day, found the ship had been set 46 miles to the southward of account, and 15 miles more on the 10th.

Lost our
rudder.

Cape St.
Sebastian
seen by the
America.

On which day the America informed us, that they had seen Cape St. Sebastian, and that at 8 A. M. it bore due west, 24 leagues; from which bearing I corrected my reckoning, and took a fresh departure, finding the ship 4 deg. 22 min. to the westward of the reckoning; from whence I judge the strong currents we have found setting to the southward must have set to the westward also; so that we were for several days within 20 and 25 leagues of the continent, and consequently passed the Bassas de India a great way to the westward of them: latitude in, by observation, 22 deg. 56 min. S. and long. 1 deg. 25 min. E. from Cape St. Sebastian; the variation 25 deg. 4 min. W. From the 10th to the 28th, had a great variety of winds and weather, but mostly from the eastern board, moderate and fair. The current has set chiefly to the southward, of various degrees of strength, from 49 to 7 miles in the 24 hours: sometimes we have not been sensible of any current for 2 or 3 days together; at others a small matter to the northward, and that but seldom. At noon, saw the land bearing N. $\frac{1}{4}$ W. at a great distance. Latitude in, by observation, 35 deg. 2 min. S. and longitude made 7 deg. 57 min. W. from Cape St. Sebastian's: the variation 22 deg. 54 min. W. On the 29th, at 2 P. M. the extremes of the land bore from E. N. E. to N. $\frac{1}{4}$ W. and a remarkable high peak N. by E. $\frac{1}{4}$ E. distance 14 or 15 leagues. This land in general seems very high and mountainous, and some part of it is exceeding high: according to our latitude, it is not laid down in the charts so far to the southward, by a great deal, as it ought to be. At noon was in latitude, by observation, 35 deg. 7 min. S. and longitude made 9 deg. 26 min. W. from Cape St. Sebastian's: the variation 21 deg. 40 min. W. had soundings 70 fathom, fine black sand. We coasted it in soundings from 68 to 50, 40, and 38 fathom, distance off shore from 15 or 16 to 7 or 8 leagues. There are many openings to the sea along this coast, which seem to form deep bays; some of them so deep we could not see the land at the further end.

On

On the 4th of March, made Cape Lagullas, which is a low point of land with a Cape Lagullas gradual slope to the seaward, and forms itself in 2 points, one running out to the southward along way into the sea; and this is the proper Cape Lagullas: the other point is also low, and lies some distance to the north-eastward of the true cape; the land between them forming a round bay, seemingly about 3 leagues wide: the coast, from the inner point, turns in with a quick rounding to the northward, and forms a very deep bay; the land to the north-eastward being seen only at a great distance. When Cape Lagullas and the point before mentioned are in one, bearing N. N. E. $\frac{1}{4}$ N. and the pitch of the cape N. by E. 4 or 5 leagues, you will then have soundings in 50 fathom, fine grey sand, and may see a very high bluff point of land close to the sea, bearing N. W. $\frac{3}{4}$ N. 9 or 10 leagues, being then the westernmost land in sight, and appears like a gunner's quoin: this lies from Cape Lagullas N. W. by W. 8 or 9 leagues; and Cape Falso W. by N. $\frac{1}{4}$ N. distance 24 leagues. I have already said Cape Lagullas is a low point of land, &c. yet, at some small distance from the sea, it is about the height of the North Foreland, and the land rises gradually to a considerable height inland-ward. At some distance in land are seen very high mountains, but no land nigh the sea near so high as the Gunner's Quoin, either to the eastward or the westward; which makes me imagine, that ships, seeing the land about this coast at 10, 12, or 14 leagues distance, must of course set the Gunner's Quoin Land for Cape Lagullas, it being the only land near the sea, that can be seen at that distance. When the Gunner's Quoin bears N. by W. it does not appear like a quoin, as it does when you are off Cape Lagullas, but in a very different form.

When Cape Lagullas bears E. $\frac{1}{2}$ N. 7 or 8 leagues, and the land of the Gunner's Quoin Mountain N. $\frac{1}{2}$ E. 4 or 5 leagues, you will have 50 fathom, fine sand; and when the Gunner's Quoin Mount, which forms a high bluff point when you are either to the eastward or westward of it, bears E. by N. and the extreme of the land to the westward, which then seems to be a pretty high steep point of land, bears N. N. W. distance off shore 4 leagues, you will have 50 fathom, coarse brown sand. The land then bearing N. N. W. trenches in quickly to the northward, and forms a bay between it and the land of Cape Falso, so very deep, that you cannot see the further part thereof from the ship's deck. Standing to the westward, in lat. 34 deg. 41 min. S. 8 or 9 leagues off shore, opposite this bay you deepen your water from 50 to 60, 70, and 80 fathom, sand and ouze, when you are about 6 or 7 leagues to the eastward of Cape Falso: the variation, 1764, 19 deg. 39 min. W. To the westward of this bay, and 5 or 6 leagues to the eastward of Cape Falso, the land is very high and mountainous near the sea, with several openings like the entrances of bays or harbours.

On the 6th at noon, Hottentots Point bore N. by W. $\frac{1}{4}$ W. distance about 5 leagues: at the same time had soundings in 68 fathom, muddy ground: latitude in, by observation, 34 deg. 41 min. S. and longitude made 13 deg. 31 min. W. from Cape St. Sebastian's: the variation 19 deg. 39 min. W. By the reckoning this day, at noon, I find the ship to be 4 leagues to the eastward of Cape Falso, or 10 leagues from the Cape of Good Hope, which, according to several observations, repeatedly made in the years 1751, 1752, and 1753, is in long. 18 deg. 30 min. E. from London; so that the true longitude of the ship will be 19 deg. 7 min. E. from London: now, allowing Cape St. Sebastian in long. 36 deg. 32 min. E. from London, deducting the 19 deg. 7 min. therefrom, our longitude, made from thence, should be 17 deg. 25 min. W. whereas by my reckoning it is only 13 deg. 31 min. W. as above; which shews that the current has set strong to the westward all along this coast, as I imagine it generally does; for, as we frequently found a southerly current, I suppose it set to the westward withal.

Hottentots Point, or Cape Falso, is the outermost point on the east side of Bay Falso, and lies about 6 leagues due east from the Cape of Good Hope, and may be seen

From Cape Lagullas to Cape Falso.

Hottentots Point, or Cape Falso.

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8 or 9 leagues: between them is the entrance into the False Bay. At the outer part of this cape there is a hill, which, when you are to the eastward of it, appears much like the Sugar-Loaf Hill in Table Bay; this hill is separate from the other high land; and a small distance within this hill there is another of the same form, but not so high: and the land near the sea, and about those hills, being very low, makes them appear very conspicuous when you are to the eastward of them; whereby Cape Falso may be known. And a small distance within the inner hill there are very high mountains, one of which is level on the top, and, at a distance, has some small resemblance of the Table Land, at Table Bay, which gives it the name of the False Cape. This has been mistaken for the Table Land; and the other 2 hills, one for the Sugar Loaf, and the other for the Lion's Rump. But there is one thing may at all times convince people of their mistake, which is the soundings. The outer hill at Cape Falso bearing N. by W. $\frac{1}{4}$ W. about 5 leagues, latitude in 34 deg. 40 min. S. had soundings 68 fathom, white muddy ground: at the same time the extremes of the land to the eastward bore E. by S. $\frac{1}{4}$ S. whereas with the Sugar-Loaf Hill in Table Bay bearing so, and in that latitude and distance from the land, you have no soundings.

I have carefully worked the bearings and distance from the land we first saw, on the 29th of February, to Cape Falso, by which I make it W. 2 deg. S. 100 leagues; whereas the charts make it W. by S. and to allow for the set of the current during the 7 days that we coasted it along shore, 30 leagues more may be added, which will make the distance of the land we fell in with 130 leagues to the eastward of Cape Falso. And as we had soundings 70 leagues to the eastward of Cape Falso, allowing 21 leagues for the current, which is in the same proportion, it will make 91 leagues.

Description
of the land.

Soundings.

The land is every where exceeding high and mountainous, both in land and near the sea, and full of large and wide openings as above mentioned. The soundings are very regular every where to the eastward: where we first made the land, you have 65 fathom, at 14 or 15 leagues off shore; and 46 or 47 fathom, 8 or 9 leagues off shore: about Cape Lagullas you have 57 or 58 fathom, 7 or 8 leagues off shore; and about 5, 6, or 7 leagues to the eastward of Cape Falso, you have 60 and 64 fathom, muddy ground, 5 or 6 leagues off shore. In the offing, Cape Lagullas bearing, by estimation, from N. E. by N. to N. about 18 or 20 leagues, in lat. 36 deg. 3 min. S. you have soundings on this bank from 75 to 80 fathom, fine grey sand; and 12 or 15 leagues to the eastward of that, the variation 20 deg. 39 min. W. 90 fathom, brown muddy sand. In this latitude the bank runs but little further to the eastward; for in 8 or 10 leagues you have no soundings. For further particulars relating to the soundings, &c. see p. 3. In the opening of Bay Falso you have 54 and 56 fathom, muddy ground; Hottentot's Point or Cape Falso bearing E. N. E. and the easternmost part of the Cape of Good Hope N. W. $\frac{1}{4}$ W. 3 or 4 leagues; in lat. 34 deg. 25 min. S. and variation 19 deg. 30 min. W. About 3 or 4 leagues further off shore you have 64 and 70 fathom. The bank does not run far off the shore hereabouts.

From Cape
Falso to the
Cape of
Good Hope.

As you run to the westward towards the Cape of Good Hope, you will shoalen your water from 68 to 60, 55, or 54 fathom, muddy ground, in which latter depth Cape Falso bears east, distance about $3\frac{1}{2}$ leagues; and the very pitch of the Cape of Good Hope (which is the south-easternmost point of land on the west side of Bay Falso) N. W. about 3 leagues. On the pitch of the Cape, or very near it, is a very high, ragged, rocky, peaked hill, something in shape like the Sugar-Loaf Hill, but not so high, with no other high land near it. Within the entrance of the False Bay you have soundings from 40 to 36 fathom, sandy ground, sometimes mud. The pitch of the Cape of Good Hope bears, from the pitch of the False Cape, by compass, W. by N. $\frac{3}{4}$ N. so that, allowing

allowing the variation, they bear due east and west of each other, in lat. 34 deg. 25 min. S. and distance 6 leagues.

You have soundings, all the way between Cape Lagullas and the Cape of Good Hope, from 50 to 60, 70, and in some places 80 fathom, sand and ouzey ground, from 5 to 10 leagues off shore.

Off the pitch of the Cape of Good Hope S. W. by S. distance 3 or 4 miles, there is a ledge of rocks even with the water's edge, on which I have seen the sea break very high. I passed about 3 or 4 miles without them in from 30 to 33 fathom, coral rocks. When in 33 fathom, Cape Falso bore E. $\frac{1}{2}$ N. and the easternmost part of the Cape of Good Hope N. by E. distance 3 leagues, and from the breakers 3 miles. From thence, standing to the westward, soon deepened the water to 40 and 46 fathom, corally bottom; and soon after lost soundings. You have no soundings after you are past these rocks till you come within 2 miles of Freeman's Point.

The Cape of Good Hope makes the west point of Bay Falso, and lies in lat. 34 deg. 24 min. S. and longitude, by astronomical observation, 18 deg. 30 min. E. from London; the variation on shore 19 deg. W. and 4 leagues off the cape, at sea, 19 deg. 31 min. W. And as the longitude of the Cape of Good Hope has not been determined heretofore with sufficient exactness, I shall, for the benefit of the curious navigator, insert the following extract from the Abbé de la Caille's Account of his Observations Astronomical, Geographical, and Physical, made at the Cape of Good Hope in 1751, 1752, and 1753, by order of the French King.

Having erected his observatory in a proper situation, about 7 or 8 feet above the level of the sea, he next proceeded to fix and adjust all his instruments, of which he had a fine apparatus, and all such as had been proved of the greatest exactness. His first observations were to determine the latitude of his observatory, which having done with the greatest accuracy, he then proceeded to enquire into the obliquity of the ecliptic, and, by a medium of 27 observations of the sun's solstitial distance, and with due allowance, he deduced the true obliquity 23 deg. 28 min. 21,2 sec. From May, 1751, till January, 1753, he continued making observations of the moon's eclipse, of the eclipses of Jupiter's satellites, of Saturn's oppositions to the sun, the same of Mars, and the occultations of the stars, &c. all which being compared with others made in Paris, it appears that the Cape of Good Hope is 16 deg. 10 min. E. from thence, to which adding 2 deg. 20 min. makes it 18 deg. 30 min. E. from London; its latitude being exactly 34 deg. 24 min. S. In order to confirm the figure of the earth, he followed the method practised by Mons. Maupertuis in Lapland, and Mons. de la Condamine in Peru, of comparing a degree of the terrestrial with a degree of the celestial meridian, having one actually measured, and confirmed by a series of triangles to determine his terrestrial mensuration, by which he found that the 34 deg. of latitude on the terrestrial globe measures 57,037 French toises. He found that the principal winds at the cape are the S. E. and N. W. the rest seldom lasting more than a few hours; the E. and N. E. blowing the seldomest of any: the N. and N. N. W. winds generally bring on foul weather and hurricanes in April, May, June, July, and August: the W. to S. W. by S. are frequently accompanied with fogs and clouds, which are soon over: sometimes violent N. W. winds blow for several days together in May, June, July, August, and September, and by fits in the other months; the sky is then constantly clouded, and they generally end in rain: the S. E. winds blow at the cape in most months of the year, but chiefly in October, November, December, January, February, March, and April; they are cold and dry, and the sky very clear, unless after a rainy season. As to the general temperature of the air, the cape is by no means a hot country: though sometimes the heats are excessive, they are but of short

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short duration. In February, 1752, Reaumur's thermometer was up at 36, which was thought very extraordinary: at midnight it was sunk to 15. An epidemic disorder immediately followed, which carried off numbers. It rarely freezes in winter, though the nights seem very cold. He never knew his thermometer sink so low as $4\frac{1}{2}$ below freezing. The mountains of Drakersteen, the height of one of which measured 1071 toises, appear white at top for some weeks, as if covered with snow; but it is no other than hail. Thunder is seldom heard near the cape; but it lightens frequently. The barometer varies from 27 inches $10\frac{3}{4}$ lines to near 28 inches 8 lines, and this chiefly in winter. The variation of the magnetick needle was 19 W. from the north. The new moon makes high water at the cape at $\frac{1}{2}$ an hour past 2 P. M. and the tide seldom rises more than 3 feet, except after a hurricane, or some extraordinary cause.

This is a most excellent place for all kinds of refreshments, and being a most wholesome climate, the sick seamen here recover speedily, especially from the scurvy.

Wood is a very scarce article, and consequently dear; but there is plenty of good water. The watering-place is at the wooden pier opposite the fort, and within musket-shot thereof: the water is laid down to the pier-head in pipes, to which you fix a hose, and fill your casks in the boat; so that great dispatch may be made in watering here.

From the
Cape, going
into Table
Bay.

Being off the Cape of Good Hope, and past the above-mentioned rocks or breakers, you may sail close along shore, and no danger till off Freeman's Point, which is to the northward of Chapman's Bay, where there are some rocks, which lie a small distance from the shore. You may go within $1\frac{1}{4}$ mile of Freeman's Point, and have soundings in 52 or 53 fathom, sandy bottom. Then steer for Green Point, keeping $1\frac{1}{2}$ mile or thereabouts off shore, you will have 50 to 48, 46, 40, 36, and 34 fathom, fine sand and broken shells. The coast forms a bay between Freeman's Point and the Sugar-Loaf Hill, which is called Freeman's Bay. Before you come to Green Point you will see Penguin Island, which is a low flat island, with a look-out house on the middle of it, where they hoist a flag when ships are in sight. If you are pretty well in with Freeman's Bay, you will see Penguin Island bearing N. N. E. $\frac{1}{4}$ E. or N. E. by N. From the foot of the Sugar-Loaf Hill to Green Point, which is a low green point, you will see several rocks above water lying some distance from the shore; but there is no danger but what you see. As you run in, give these rocks a reasonable birth, and you will shoalen your water gradually from 34 to 30, 26, 20, 16, and 12 fathom, rocky ground; so that there is no anchorage hereabouts. You may borrow upon Green Point, to 10, 9, or 8 fathom, and no danger; and so steer up the bay, and you will have 8, 7, or 6 fathom, regular soundings; but rocky ground till you get about a mile to the eastward of Green Point; and then the bottom is sandy, and fit for anchorage.

Anchorage.

You may anchor in Table Bay, opposite the town, in 7, 6, or 5 fathom; but it is not very holding ground. I have anchored in a good and convenient birth, and indeed it is allowed to be the best birth in the bay, the house on Penguin Island bearing N. $\frac{1}{2}$ W. Green Point N. W. $\frac{3}{4}$ N. the flag-staff on the Lion's Rump W. $\frac{1}{2}$ S. Charles's Mount S. $\frac{1}{2}$ W. in 5 fathom, distance from the town 1 mile, and from the nearest shore $\frac{1}{2}$ a mile. About $1\frac{1}{2}$ or 2 cables length further to the eastward, is another good birth, where you have $6\frac{1}{2}$ fathom. All over the west side the bay is clear ground, but the N. E. part of the bay is all foul.

A descript.
of the land
about Table
Bay.

All the land about the Cape of Good Hope is very high; but the Table Land is most remarkable, which is an excessive high mountain, quite level on the top, and breaks off perpendicularly at both ends till it joins the other high lands near it. The east part of the Table Land joins to a high peaked mount, called Charles's Mount; and the west part joins to the Sugar-Loaf Hill, a very high and remarkable peaked mountain, much resembling the top of a sugar-loaf: on the top of this hill the Dutch have a look-out house,

where

where they hoist a flag when any ships are in sight. To the north-westward of the Sugar Loaf, and joining thereunto, though at a pretty good distance, is another mountain, but much inferior to the Sugar-Loaf Hill in height, called the Lion's Rump, where they also keep a look-out, and hoist a flag. These lands make this place very remarkable, particularly the Table Land, which is much higher than any land near it, and may be seen a great way at sea in clear weather. The latitude of the Table Land is 34 deg. 4 min. S. and the same longitude as the Cape of Good Hope, they lying nearly north and south of each other. The Cape town is situated at the foot of the Table Land, in a fine pleasant valley near the sea.

It frequently happens, that when ships get a-breast Green Point, and come to open Table Bay, they meet with strong fiery breezes from S. E. or E. S. E. blowing right out of the bay so hard, that a ship cannot turn to windward. When that is the case, it is usual for ships to bear away for Penguin Island, taking care to keep well to the southward and eastward of it, and not go within $1\frac{1}{2}$ or 2 miles of the S. or S. W. parts thereof; for at that distance there lies a ledge of rocks under water, on which the sea breaks very high in bad weather; but they do not shew themselves in fine weather, therefore they are then the most dangerous. You may anchor on the east side of Penguin, in 12 or 14 fathom, 1 or $1\frac{1}{2}$ mile off it, or, within $\frac{1}{4}$ of a mile of it, in 10 or 11 fathom, where you are a good deal sheltered from the S. W. sea by the ledge of rocks above mentioned, and have clear anchoring: but all the N. and N. E. parts of this bay are foul ground. Ships lie at Penguin till the wind comes to S. W. or W. which it generally does in the morning, during the fair-weather season; when they weigh, and run into Table Bay, and anchor in a proper birth.

In their summer-time or fair-weather season, which is from October to April, you generally have, in the mornings, regular sea-breezes from S. W. and W. which continue till noon, or sometimes longer; and then the wind comes off the land at S. E. or E. S. E. and mostly blows fresh the remaining part of the day, and all night till morning, when the sea-breeze comes off again. In the months of May, June, July, and August, the W. and S. W. winds blow strong, and are frequently accompanied with fogs and cloudy weather, but are soon over. Sometimes violent N. W. winds blow for several days together, and by fits in the other months: the sky is then constantly clouded, and they generally end in rain. These winds extend to the 27th degree of latitude, and from 100 leagues to the westward, to 200 leagues east of the cape. The principal winds at the cape are the S. E. and N. W. the others seldom lasting longer than a few hours; the E. and N. E. winds blowing the seldomest of any: the N. and N. W. winds generally blow in hurricanes, and bring on foul weather: the S. E. winds blow in most months of the year, more or less, but chiefly in the summer season, when they frequently blow strong for several days together; and these are the most prevailing winds for 200 leagues to the eastward of the cape, at this season. Whenever you see the Table Land begins to be clouded, it betokens a strong E. or E. S. E. wind, which, soon after it is clouded over, comes on, and blows excessive hard, sometimes for 2 or 3 days together; whereby ships frequently part their cables, or bring both anchors a-head: therefore it is usual, as soon as ships are moored in this bay, to strike their yards and top-masts, and make all as snug as possible.

It is reckoned extremely dangerous for ships to lie in Table Bay after the 10th or 15th of May. The Dutch never suffer their ships to lie after that time, on account of the approaching season, when the N. W. winds are daily expected to set in, which blow so violently, that no ship can possibly ride it out. Many ships and lives have been lost in the attempt, or when they have been surprised here unexpectedly with those winds.

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To sail out
from Table
Bay.

As it is customary for ships to sail from Table Bay with the wind south-easterly, they generally go out between Penguin Island and the Continent; whereby they carry a true and steady wind with them all the way they go; whereas, if they sail out between Penguin and Green Point, they run out of the true wind, and may lie becalmed several hours under the high land.

Of beating
round the
Cape in the
winter,

A ship that is about doubling the Cape of Good Hope for Europe in the months of May, June, July, or August, when the winds blow very strong from the westward, will always find a current in their favour, setting round the cape, against those storms, even though they were lying to. Such a ship, after having had soundings, &c. off Cape Lagullas, as mentioned in p. 113. will soon after, as she goes to the westward, lose soundings; which is a convincing proof that she is to the westward of Cape Lagullas. And as the weather at this season is generally thick and cloudy, so that you cannot see the land far; and as indeed it would be imprudent to attempt it after losing soundings to the westward of Cape Lagullas, since you cannot be very exact in your reckoning, on account of the strong current; therefore, that you may know when you may steer to the north-westward with safety, your best and surest guide is the variation: so that, being near the latitude of the Cape of Good Hope, and finding the variation any thing under 19 deg. W. you may be assured you are far enough to the westward of the Cape of Good Hope, and may steer to the north-westward for St. Helena.



Instructions for sailing from the Cape of Good Hope, for the Island St. Helena, from thence for the Island Ascension, and from thence for the English Channel.

From the
C. of Good
Hope to St.
Helena.

AS soon as you are clear of the land, steer N. W. which will soon bring you into the S. E. trade; and indeed, in the fair-weather season, you generally have fresh and steady gales, south-easterly, all the way. As I have all along made the latitude and variation my principal guide in navigation, so as not to lay any great stress on the dead reckoning, or longitude by account, especially where there is a quick increase or decrease of the variation; I shall therefore be the more particular in giving an account of the variation we made through the whole of this passage. I am sorry to say, that I know it has been too much the practice among sea-faring men in general, in observing the variation, not to be so exact as could be wished: they generally think it of no other use than to know what allowance to make in the course steered, &c. in which case a quarter of a point is looked upon as a thing of no great consequence: but I must beg leave to assure them, that observing the variation with exactness is of much greater utility than merely to correct the course; for, if nicely observed, it answers all the ends of longitude in navigation, and particularly where the increase or decrease is quick, and where it changes from east to west: therefore I hope the variation will be more strictly and carefully observed for the time to come; and the navigator will certainly find it answer his account, as it is undoubtedly one of the greatest improvements in navigation, if properly observed; and especially as Dr. Knight's compass so much exceeds the old azimuth compasses, and is so

Seamen not
sufficiently
exact in ob-
serving the
variation.

curious

curious and complete in every respect, as to be capable of taking the azimuth or amplitude with such exactness, that I think none can err in taking the variation thereby: nor did I think the variation was ever found to any degree of certainty till Dr. Knight's compass was invented; at least, not to so great a degree of exactness as it now is by his compass. And it is my opinion, that, sooner or later, there will be some very important discoveries made by the variation of the compass; so I hope there will be more attention paid to the variation, for the time to come, than hitherto has been. In steering to the north-westward you will rather increase the variation; for in lat. 32 deg. 40 min. S. and longitude, made from the Table Land, 1 deg. 24 min. W. we had 19 deg. 35 min. W. and in lat. 31 deg. 30 min. S. and long. made 3 deg. ditto, had 19 deg. 25 min. W. and in lat. 29 deg. 50 min. S. and long. as before, 5 deg. had 18 deg. 42 min. W. variation, which decreases gradually as you run towards St. Helena. In the parallel of that island, and 3 deg. 10 min. to the eastward thereof, we had 13 deg. 42 min. W. variation; and about 2 deg. to the eastward, had 13 deg. or 12 deg. 55 min. W. and 1 deg. 20 min. to the eastward, had 11 deg. 50 min. W. and in St. Helena Road had 11 deg. 38 min. W.

St. Helena is a high, steep, rocky island, about 18 or 20 miles in circumference, accessible The Island
only at the landing-place, on the N. W. side thereof, which is well defended with batteries St. Helena.
of guns. A ship bound to this island must run down along the north side of it, and within $\frac{1}{2}$ a cable's length of Sugar-Loaf Point, and afterwards keep the shore close a-board, within a cable's length: there is no danger, the shore being bold and steep to. On the west part of Sugar-Loaf Point stands a small fort; a little to the southward thereof is Rupert's Valley, where there is a good line of guns: the next point to the southward of the valley is a high, steep point, called Munden's Point, on the top of which there is a battery of guns; this point must be kept close a-board: the next valley is called James's, or Chapel Valley, off which is the place of anchoring. You may anchor in from 8 to 15 fathom. The flag-staff at the fort bearing from S. S. E. to S. E. by S, Sugar-Loaf Point N. E. by E. and Horse-Pasture Point S. W. by W. $\frac{1}{2}$ W. distance off shore about $\frac{1}{2}$ a mile: with these bearings you have a good and convenient birth for watering. This bank runs out to the westward, from the fort, about $1\frac{1}{2}$ mile, and deepens gradually from 7 fathom, near the shore, to 30 or 35 fathom, about $1\frac{1}{4}$ mile off shore; from whence it deepens suddenly to 60 fathom, and then no soundings. The bottom in the road is coarse sand and gravel. You have no soundings till you come a-breast Rupert's Valley, and then you have 18 or 20 fathom.

Notwithstanding the barren appearance of this island from the sea, there are many Provisions,
fruitful valleys in the inland parts, which produce fruits and vegetables suitable to the &c.
climate, and afford good pasture for a great number of the finest cattle in the world, with which they abound. The beef and mutton are excellent in their kind; and they have abundance of poultry; also plenty of good potatoes, yams, and other vegetables. The air is always cool and pleasant, and the island healthy, though it lies in so low a latitude; a fresh S. E. trade blowing continually over it. As ships meet with good refreshments here, their sick speedily recover from the scurvy. Here is plenty of good water; but wood is rather a scarce article. One watering-place is just without James's Fort, where there is a crane to strike the casks into the boats: the other is at Lemon Valley, where is the best water, and you fill the casks in your boat with a hose, only it is a little further to fetch it.

I observed the latitude in the road 15 deg. 59 min. S. and made longitude, from the Lat. &c.
Cape of Good Hope, 22 deg. 42 min. W. which makes but 4 deg. 12 min. W. from
London, computed from the celestial observations at the Cape by the Abbé de la Caille;
whereas Mr. Maskelyne, by celestial observation, makes it 5 deg. 49 min. W. from
Greenwich,

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Greenwich, or 5 deg. 44 min. W. from London; therefore must impute the difference to our having partaken of part of the current, well known to set to the westward, round the Cape of Good Hope; especially as few ships are known to make more longitude between these 2 places. The variation, by several observations, whilst lying in the road, 11 deg. 38 min. W. The tides here are little or none.

From St.
Helena to
Ascension.

Between the Island St. Helena, and the Island Ascension, the S. E. trade blows, all the year long, fine, steady, pleasant gales, and mostly fair weather. The variation decreases very gradually between them. In the latitude of Ascension, and $1\frac{1}{2}$ deg. to the eastward thereof, we had $10\frac{1}{2}$ deg. W. variation; and about 1 deg. to the eastward of it, had 9 deg. 52 min. W. and at Ascension had 9 deg. 48 min. W.

Island
Ascension.

This is a high, barren, rocky island, about 20 miles in circumference, and may be seen 10 leagues in clear weather. It is so entirely barren, that there is not the least appearance of any kind of vegetation; nor is there any fresh water on it: there are sufficient reasons for its being uninhabited. Yet there are many goats on this island, of which our people shot several; they were very meagre, as might reasonably be expected: and it abounds in sea-turtle, the largest and finest, perhaps, in the world. A ship bound to this island must sail down along the north side of it, and may keep it close a-board, it being bold and steep to; and when you come to haul up for the road, you must still keep the shore close a-board: you may sail within 2 cables length, or less, of it (there being no danger) till you bring Cross Hill on the middle of the Sandy Bay.

Anchorage.

This bay is about a large quarter of a mile deep, and about $\frac{1}{4}$ of a mile wide. The westernmost point of this bay is dangerous, a reef of rocks running out from it about a mile from the shore, on which, in bad weather, the sea breaks; therefore care must be taken not to go too near it. The anchoring-place is on the N. W. side of the island, off the above-mentioned Sandy Bay, opposite which, in-land, there is a high hill by itself, with a flag-staff and cross upon it, which gives it the name of Cross Hill. A good mark for anchoring is to bring Cross Hill on the middle of the Sandy Bay, when it will bear S. S. E. $\frac{1}{2}$ E. and the extremes of the island from N. E. $\frac{1}{2}$ E. to S. W. $\frac{1}{2}$ S. when you will be in 10 fathom water, and about $\frac{1}{2}$ a mile off shore. The bottom is sand and gravel, clear ground. This is as good a birth as any in the road.

Lat. &c.

The latitude, observed in Ascension Road, is 7 deg. 57 min. S. and longitude, made from St. Helena, 7 deg. 41 min. W. According to Mr. Maskelyne's Table of the Longitude of Places, determined by astronomical observations, the true difference of longitude between these islands is 8 deg. 10 min. which shews that we have been set $\frac{1}{2}$ a deg. to the westward, in our run from St. Helena hence; but we were not sensible of any current by our observation of the latitude. I am the rather inclined to allow the difference to a current, as I find Mr. Maskelyne, in the Warwick, made the ship's reckoning but 6 deg. 50 min. W. from St. Helena to Ascension.

From the
Island
Ascension
to England.

Sailed from Ascension, allowing it to lie in lat. 7 deg. 57 min. S. and longitude, by Mr. Maskelyne's observation, 13 deg. 54 min. W. from London: we crossed the Line with 7 deg. 56 min. W. variation, and longitude, made 6 deg. 11 min. W. from Ascension, and had the S. E. trade-wind, fresh and steady gales, to lat. 3 deg. N. From lat. 3 deg. to 5 deg. N. had mostly light winds and variable, from S. E. to N. E. with some few calms. In lat. 5 deg. 21 min. N. and longitude, made from Ascension, 9 deg. 10 min. W. variation 6 deg. 50 min. W. we met with the N. E. trade-wind, which continued fresh and steady gales to $28\frac{1}{2}$ deg. N.

Caution
not to cross
the Line
too far to
the east-
ward.

Notwithstanding the few calms we met with, and the quick change of the trade-winds from S. E. to N. E. yet I look upon all this as merely accidental; though I have seen several journals of ships that have crossed the Line with nearly the same variation that we did, and consequently as far to the eastward, and about the same time of the year, and met

met with the same kind of winds that we did: yet all this is not sufficient to prove it a general rule, to cross the Line so far to the eastward, and more especially if the sun is on or near the Line; when, from 5 deg. of either latitude, you are liable to meet with calms, but more so to the eastward towards the Coast of Guinea; since experience sufficiently proves that the farther to the eastward on the Line, or under 5 deg. of either latitude, the more subject you are to calms: I therefore must observe, that the same rule which holds good in crossing the Line outward-bound to India, will also hold good homeward-bound, which is to cross it with about 5 deg. or 5 deg. 30 min. W. variation, which is nearly about the meridian of St. Jago; or homeward-bound, not to cross the Line with more than 6 deg. W. variation, where you will be the less subject to calms.

I have passed to the westward of the Cape de Verde Islands, in lat. 16 deg. 5 min. N. which is about the latitude of Bonavista, with 4 deg. 4 min. W. variation: longitude, made from Ascension, 19 deg. 56 min. W. or about 12 deg. to the westward of Bonavista. I have also passed the lat. of St. Antonio, the northernmost and westernmost of the Cape de Verde Islands, with 3 deg. 37 min. W. variation: long. made from Ascension, 20 deg. 48 min. W. This was the lowest variation I had in this passage; reckoning we were then about 10 deg. to the westward of St. Antonio. From thence, as we ran to the northward, found it increase. In lat. 28 $\frac{1}{2}$ deg. N. found the N. E. trade-winds began to decrease; they first moderated, then turned to little winds and variable, and in lat. 29 to 30 deg. N. the winds veered from the E. N. E. to S. E. S. and S. W. in which quarter they mostly continued. In lat. 29 deg. N. longitude, made from Ascension, 23 deg. 10 min. W. had 6 deg. 30 min. W. variation. In lat. 38 deg. 40 min. N. which is pretty near the latitude of Fial, one of the western Islands; longitude, made from Ascension, 22 deg. 8 min. W. had variation 12 deg. 44 min. W. suppose we were then about 8 deg. to the westward of Fial, and 5 $\frac{1}{2}$ deg. to the westward of Carvo; since the variation was observed this present year by his Majesty's ships Weymouth and Panther, amongst the western islands and in Fial Road, to be 13 deg. 34 min. W. so that a ship, in latitude of Fial, observing the variation to be under 13 deg. 30 min. W. may be sure she is to the westward of the western islands. About 3 deg. to the westward of Carvo, (the northernmost and westernmost of all the western islands, in lat. 40 deg. N. long. 31 deg. W. from London) you will have variation 13 $\frac{1}{2}$ deg. W. and in lat. 40 deg. 50 min. N. longitude, made from Ascension, 19 deg. 44 min. W. and about 3 deg. to the westward of Carvo, there is 13 deg. 37 min. W. variation. Though the increase of the variation near the western islands is so slow or gradual, that you will run 3 deg. of longitude to the increase of 55 min. or 1 degree variation; so also, when you are to the northward of the western islands, and steering to the eastward, you will increase the variation very gradually: for example, from the last-mentioned variation, latitude and longitude, you will run 18 or 19 deg. to the eastward, before you will increase the variation to 18 $\frac{1}{2}$ deg. W. which you will have in latitude 49 deg. 10 min. N. to 49 deg. 30 min. N. and longitude in about 15 deg. W. from London, or 8 $\frac{1}{2}$ deg. W. from Scilly; which shews that the variation increases very gradually, or at the rate of 4 $\frac{1}{2}$ deg. of longitude, to 1 $\frac{1}{4}$ deg. of variation. But it has a quicker increase as you come nearer the English channel; for in lat. 49 deg. 20 min. to 49 deg. 30 min. (which is the proper parallel to steer to the eastward in for the English channel) and long. 10 $\frac{1}{4}$ deg. W. from London, or 3 $\frac{1}{2}$ deg. W. of Scilly, you will have variation 19 $\frac{1}{4}$ to 19 $\frac{1}{2}$ deg. W. and have soundings hereabouts in 95 or 100 fathom, fine grey sand; 46 or 50 leagues to the westward of Scilly. In lat. 49 deg. 25 min. and long. 9 deg. 38 min. W. from London, or 2 deg. 53 min. W. of Scilly; and variation 19 deg. 51 min. W. you have soundings 82 fathom, gravel and pebble stones; 38 or 40 leagues to the westward of Scilly. In lat 49 to 49 $\frac{1}{2}$ deg.

Variation in passing the Cape de Verde Islands.

The lowest variation we had.

Lose the N. E. trade.

Variation in latitude of the western Islands.

Variation at Fial.

The proportional increase of variation running to the eastward.

A quicker increase of the variation.

Variation in soundings, how far west of Scilly.

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49 $\frac{1}{2}$ deg. N. and long. 8 $\frac{1}{2}$ deg. W. from London, or 1 $\frac{1}{2}$ deg. W. of Scilly; variation 20 deg. 7 min. W. you will have soundings at 75 fathom, coarse white sand, like oatmeal, with some pieces of shells; 20 leagues to the westward of Scilly. In lat. 49 deg. 10 min. to 49 deg. 25 min. N. longitude in 7 deg. 6 min. W. from London, or 21 min. W. from Scilly, it bearing N. N. E. distance 12 or 13 leagues, you have variation 20 deg. 30 min. W. and soundings 68 fathom, fine white sand, with some small pieces of shells. In lat. 49 $\frac{1}{4}$ deg. N. when you have soundings at 65 fathom, white sand, with broken shells, Scilly bears north of you, distance about 9 leagues. In lat. 49 deg. 23 min. N. variation 21 deg. W. soundings 60 fathom, coarse brown sand, you are W. S. W. $\frac{1}{4}$ S. distance 34 leagues from the Start, the Lizard bearing N. 47 deg. E. distance 17 leagues, and you are 8 leagues to the eastward of Scilly. In lat. 49 deg. 37 min. N. variation 21 deg. 2 min. W. soundings 52 fathom, gravel stones, and small shells; the Lizard bears N. W. by N. 8 or 9 leagues, and the Start E. 36 deg. N. distance 17 leagues. In lat. 49 deg. 53 min. N. variation 20 deg. 6 min. W. soundings 45 fathom, broken shells, with some stones; the Start Point bears E. N. E. $\frac{1}{2}$ N. distance 9 or 10 leagues; the land seen from the deck. The Start Point E. N. E. the entrance of Plymouth Sound N. by E. the Eddystone N. by W. $\frac{1}{4}$ W. distance 3 or 4 leagues; distance off shore about 6 leagues, you have soundings 44 fathom, fine white sand; the variation 20 deg. 6 min. W. The high land of St. Alban's N. E. $\frac{1}{2}$ E. distance 7 or 8 leagues, in 34 fathom, coarse white sand, with gravel stones; you have variation 19 deg. 20 min. W. These observations were made in July, 1764.

Observations on the variation in coming into the channel.

A general rule in respect to the soundings coming into the channel.

By the above observations of the variation, you see the quick increase of the variation coming into the English channel; so that there is no place in the world where the variation is a surer guide of your approach towards the land, provided you have a good observation of the latitude. You may also observe, that the highest variation in the English channel is off the Lizard, and that it decreases as you run farther up. I have with great care and exactness observed the variation coming into the English channel, and ascertained the distance to the westward from Scilly, the Lizard, and Start Point, with the soundings as above mentioned; all which, I am sure, are exact, and may be depended on, in regard to the soundings: I mean the depth of water; for, as to the different sorts of soundings, the variety is so great, that, in my opinion, little can be depended thereon; for I have observed that you seldom have two casts of the lead alike: I therefore shall recommend the depth of water only, with this one general rule, viz. that to the southward of the proper parallel, toward Ushant and on the coast of France, the water is deeper, and the soundings coarser, than on the English coast, being mostly gravel, with pebble stones; if any sand, it will be very coarse: whereas on the English coast, towards Scilly, 20 leagues to the westward of it, 9 or 10 leagues to the southward thereof, and 15 leagues to the eastward of it, the soundings are white, grey, or brown sand, sometimes mixed with broken shells, and hakes teeth. In the proper parallel of latitude, or from 49 deg. 20 min. to 49 deg. 30 min. N. your soundings will, in general, be fine white or grey sand, sometimes brown sand.

Some

Some general Rules to be observed, coming into the English Channel.

THE proper parallel of latitude to keep in, to steer to the eastward for the entrance of the channel, is from 49 deg. 20 min. to 49 deg. 30 min. N. and when you have increased the variation in that parallel to 19, or $19\frac{1}{4}$ deg. W. you will have soundings at 95 or 100 fathom water, 46 or 50 leagues to the westward of Scilly. Steer to the eastward, in the aforesaid parallel of latitude, till you shoalen the water to 65 fathom, when you may be sure Scilly bears north of you, distance about 9 leagues. Still direct your course to the eastward, so as to keep in the same parallel of latitude, or 49 deg. 30 min. N. till you shoalen the water to 55 fathom: you may then with great safety steer in N. E. by E. in order to make the Lizard, which you will get sight of, by steering so 3 or 4 leagues: you will then see the Lizard bearing N. N. E. or thereabouts of you, distance 7 or 8 leagues.

I would recommend it as a general rule, for all ships coming into the channel, to make the land about the Lizard, it being the properest place for a land-fall; and then, if thick, hazey, or bad weather come on, you know where you are, and what course to steer; whereas I have known ships neglect making the Lizard, and run up the channel a great way without seeing the land, and have then met with hazey and bad weather, which has exposed them to much danger: they then could not make the land on account of the thick, hazey weather, and have been much puzzled to know how far they had got up the channel, nay, even have not been sure what side of the channel they were upon. In this state of fear and confusion, I have known a ship steer a course to avoid the dangers on the coast of England, which ran them a-shore on the coast of France, where they were lost; whereas, if they had made the Lizard, they would have had a short departure, and could have determined, with great certainty, where they were when so taken in hazey or bad weather: and in all the practice of navigation short departures are certainly the best; but absolutely necessary in narrow seas, like the English channel: and as lights are placed on the Lizard, a ship may with great safety make it in the night as well as the day, the lights standing so high, that they are seen at a great distance, and the Lizard Point being a bold land, and steep to. The Lizard bearing from N. by W. to N. by E. distance 3 leagues, you will have 45 fathom water, coarse gravel, stones, and shells, and pieces of slate: and the Lizard bearing north, distance 2 leagues, you will have 45 fathom, pebble stones, and scollop shells; which shews there is no danger in running for this land, night or day.

And I would recommend it to all those who are desirous to be well acquainted in the channel, to keep their lead constantly going, when the wind and weather will permit them so to do; and more frequently set the bearings of the land, at least every 2 hours, by which they will be made better acquainted with the soundings off all the head-lands, and off the coast between them at different distances from the land; which will give them a more perfect knowledge of the channel; and they then will not be so at a loss to know where they are in hazey weather, or night time; taking care to note them down in their log-book, by which they will not only gain experience themselves, but will also be instructive to others.

I have been informed by persons of undoubted veracity, that they have known those who, having been entrusted with the command of ships of great consequence, have steered the course up channel by the draught of the channel, without allowing the variation: and

General rules to be observed in coming into the channel in respect to soundings.

The hazard ships run in not making the Lizard.

Soundings near the Lizard.

They are recommended to keep the lead going.

Caution to prevent mistakes in allowing the variation.

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they insisted upon it that the variation was allowed in the draught; whereby they have run into great danger, and narrowly escaped being lost. This is a thing which very much surprised me to hear, that any man, who had been entrusted with the command of a ship, or had any thing to do with the navigating thereof, could be so ignorant, and void of reason. I hope there are no more such ignorant British Navigators; but, lest there should, I beg leave to acquaint them, that the channel-draughts are made without allowing for the variation, it being left to the navigator to allow the variation, as he shall from time to time find it increase or decrease; the channel-draughts being made as if there were no variation: for instance, by the draught of the channel, the coast lies, or the course from the Lizard to the Start, to the Isle of Wight, and to Beachy-Head, is E. by N. and W. by S. therefore, to allow the variation, which is at least 19 deg. 20 min. W. or $1\frac{1}{4}$ point, shews, a ship bound up channel must steer E. $\frac{3}{4}$ S. to make an E. by N. course, which is the along-shore course up channel, and W. $\frac{3}{4}$ N. in going down the channel. I hope this hint is so plain, that none can mistake it, and that it will prevent any more blunders of the kind, which may be attended with dangerous consequences; though I never should have imagined a hint of this kind any wise necessary, had I not been told that there are people capable of making such mistakes.

Allowances
of variation
to be made.

In respect to the allowances to be made for the variation, coming into the channel, and in the channel, please to observe what follows, viz. From 20 leagues to the westward of Scilly, at Scilly, and as far to the eastward as the Lizard, you cannot allow less than 2 points, W. variation; and from the Lizard, all the way up channel, to the South-Foreland, $1\frac{1}{4}$ of a point, W. variation.

Soundings
as you run
up the chan-
nel.

From the Lizard direct your course up the channel. Between the Lizard and the Start you will have soundings, in the fair-way, from 45 to 42 fathom: keep without 40 fathom, and you need fear no danger from the Eddystone. I have had 39 fathom water in passing by the Eddystone, within 3 miles of it, when it bore N. by W. N. and N. by E. the same distance, and depth of water. From the Start to the Isle of Wight you will have soundings, in the fair-way, from 35, a little to the eastward of the Start, to 32 fathom; Portland bearing N. 4 leagues. From Portland to Peverel Point, and to the Needles, you will have 28 to 30 fathom in the fair-way, or 4 or 5 leagues off shore. Keep without 28 fathom, and you need not fear the indraught of the channel of the Needles. You may pass by the Wight in from 25 to 30 fathom; distance off it from 3 to 5 leagues. Between the Isle of Wight and Beachy Head you will have soundings, in the fair-way, from 30 to 22 fathom. Keep without 20 fathom, and you need fear no danger from the Owers; but come no nearer them than 18 fathom, night or day. Off Beachy Head, and between that and Fair-Lee, you have 21 and 22 fathom, between 3 and 4 leagues off shore; and 30 to 35 fathom 6 or 7 leagues off shore.

The want
of proper di-
rections in
the channel.

I cannot say any more about the channel, without entering into particulars which would swell my work beyond the limits I at first proposed to myself; though I must say, I know nothing more wanting than proper directions for the English Channel, and for sailing in and out of the principal harbours, &c. which might be the saving of many ships; for the channel is most certainly a dangerous navigation in the winter-time; where you have hard storms, short days, and very long, dark nights; the weather frequently foggy, or very hazey, for several days together, so that you cannot see the land. It is then the ingenious navigator's art, skill, and experience, are put to the trial: it is then he wants to know, by his soundings, whereabouts he is; how far he has got up or down the channel; which side of it he is upon; how far off the shore he is by his soundings; how the tides set, and the time of their flowing, that he may take all advantages of them, by standing on that tack whereby he can take the tide under the lee-bow, his only

only assistance to help him off a lee-shore, &c. And, when the weather clears up, that he can see the land, with perhaps a harbour just under his lee, and night coming on, it is then he stands in need of a particular description of that harbour, with proper directions for sailing into it, which are much wanted: but so little encouragement is given to undertakings of this kind, that there are little hopes of seeing it done, though nothing could more conduce to public advantage and utility.

I hold the art of navigation in the highest esteem, and wish all imaginable success to navigators in general, and hope every one will contribute something towards the improvement of this noble art, by their accurate observations, wise and judicious remarks, &c. And, though they may not have a sufficient quantity for a publication, or, if they have, may be unacquainted with the method of publishing; in either case I would recommend them to the Publisher hereof, who has been very assiduous, for several years past, in collecting such Remarks, &c. in order to make them public in due time; whereof many are inserted in his New Directory, of which he hopes shortly to put forth a new edition, with the addition of such remarks, observations, &c. as have come into his hands, or may shortly be communicated to him; and in the mean time desires his most thankful acknowledgements of all favours to the several worthy navigators who have, from time to time, assisted him therewith.



Mr. *Nichelson's* ADDITIONS
TO HIS
REMARKS and OBSERVATIONS, &c.

To be added after the 2d Paragraph of the 6th Page of the Preface.

IT has been customary for ships bound to India to put in at St. Jago to get a supply of water and fresh provisions, of which there is great plenty at that island: and it is well worth their while to stop there, especially if they have had a long passage from England; since this contributes greatly to the health of the ship's company the remainder of the passage to India. It is with concern I am obliged to say, that I have known several ships unfortunate enough to miss this island, when they fully intended to stop there for refreshments, and have been forced to proceed to India without any; which has laid them under great difficulties, and proved very injurious to the health of their people. I shall therefore endeavour to shew by what means these ships missed the Island St. Jago; and then how this may be avoided for the future; with directions for anchoring in Porta Praya Road, the chief port of that island.

The three principal causes of ships missing the Island St. Jago are, that at the time of year they want to call there the sun is near the zenith of the island, and therefore their observations are not very correct; that at this time also the weather is generally so very hazy about these islands, that they cannot be seen far; and that their steering to make St. Jago is likewise wrong. I therefore recommend the following method for making the Cape de Verde Islands, when bound to St. Jago.

Being in 16 deg. 50 min. N. the latitude of Sall, with 8 deg. W. variation, which you will have 12 or 14 leagues to the eastward thereof, steer W. by N. This course, with allowance for variation and a southerly current, which you have always amongst and near these islands, will much about keep you in the parallel.

The Island Sall is a high bold island with a peak upon it, and may be seen a great way in clear weather: it lies so near the Island Bonavista, that you cannot but make one or t'other of them, (they bearing nearly N. and S. of each other) that is, you cannot pass between them without seeing them both. When you get sight of them, keep to the eastward of Bonavista; and when to the southward of it, steer for the Island of May, which you will soon get sight of. You must also go to the southward of that island; and when you are near it you may see the Island St. Jago, which is high land: steer for it, and keep along the S. E. coast thereof until you come to a high steep point of land, a-breast of which you will have Porta Praya Road open all at once, and may see the governor's house and the castle, being white, on the top of the hill, and the town near it. You must haul close round the above-mentioned point, and keep within a cable's length of the shore until you

come

come a-breast the small island that lies on the west side of the road or bay, when you may anchor in $7\frac{1}{2}$ fathom water, the east point of the bay bearing E. by S. the west point S. W. by W. the fort N. W. $\frac{1}{4}$ N.

At the End of the 2d Paragraph in Page 50 add,

Therefore, in my opinion, the surest method of making the passage from Zeloan to Bengal, or the Coast of Coromandel, in the N. E. monsoon, is to cross the Line, and run into 5 or 6 deg. of south latitude, where you will meet with strong westerly winds, blowing constantly, from the beginning of November to the latter end of March or April, between the N. W. and S. W. These winds, at this season, extend from 2 to 10 deg. of south latitude. Here ships may run down their easting very speedily, and so in all probability make a quick passage to Bengal, the Coromandel Coast, &c. keeping to the eastward, making Acheen Head, and proceeding as before directed.

To precede the last Paragraph in Page 83.

From the Island Cabra, or Goat Island, the course to the Island Mirabelle, or Corigedore, is N. E. $\frac{1}{4}$ E. distance 15 leagues.

In the Remarks on a Passage from Manila, &c. in Page 89. after the Words "and endeavour to get sight of it," add,

Being in the latitude of Sapata, and having no soundings, you may be assured you are to the eastward of it. In the night time, or hazey weather, if Sapata is not seen, &c.

At the End of the aforesaid Paragraph, add,

But if it be night, or hazey weather, keep in 34, 35, or 36 fathom; and that depth of water will carry you clear to the eastward of Pulo Timoan, Pulo Pisang, and Pulo Auore, distance to the eastward of Pulo Auore from 3 to 6 leagues, in the fair-way, and clear of all danger.

Directions for Simon's Bay on the Western Coast of Bay Falso.

To be added after the 2d Paragraph in Page 115.

As Simon's Bay is a safe and good road at all times of the year, but more especially from the beginning of May to the beginning of October, when ships cannot lie in Table Bay; and where all kinds of refreshments may be had the same as at the Cape Town; I shall therefore give directions for ships going in and anchoring there.

Hottentots Point, or Cape Falso, is the outermost point on the east side of Bay Falso, and lies about 6 leagues due east from the Cape of Good Hope, and may be seen 8 or 9 leagues in clear weather: between them is the entrance into the False Bay. In the opening of Bay Falso you have 54 and 56 fathom, muddy ground; Hottentots Point bearing E. N. E. and the easternmost part of the Cape of Good Hope N. W. $\frac{1}{4}$ W. distance 3 or 4 leagues, in latitude 34 deg. 25 min. S. and variation 10 deg. 30 min. W.

On entering into Bay Falso, it will be best to steer about midway between the Cape of Good Hope and Cape Falso; and when within the said capes, edge over for the western shore until within a league of it; in which track you will have soundings from 40 to 36 fathom, sandy ground. In case of its falling calm, or that you have not day-light enough to get into Simon's Bay, you may anchor in from 36 to 20 fathom, clear sandy ground. As you sail up False Bay, you will see, on the N. W. side, some remarkable white sand-hills appearing like snow: keep sailing about a league off shore until these hills are fairly open; and then steer for them N. W. by N. by compass, until Noah's Ark and Roman's Rocks appear.

appear. If the wind should be out of the Bay, you may turn it in, standing within a mile and a half of each shore, without danger. If you have a S. or S. E. wind, it will be best to steer in for Simon's Bay between Noah's Ark and Roman's Rocks; for, when near in, the winds are apt to draw off from the high land to the westward; but you may go in on either side of Roman's Rocks, and anchor in Simon's Bay, about half a mile off shore, Noah's Ark bearing about S. E. by E. and Roman's Rocks E. $\frac{1}{2}$ S. in 8 or 9 fathom, sandy ground; and though sand, it holds surprisingly.

In Simon's Bay 13 or 14 sail of ships may lie moored in safety. Ships moor here a cable each way, the best bower to the N. W. and small bower to the S. E. as the N. W. winds generally prevail in the winter time, and come off the hills in excessive strong gusts, with rain and hail. The new moon makes high water here at half past 3 P. M. The tides seldom rise more than 3 feet, except after a storm, or some extraordinary cause.

There is no tide or current to be perceived all over Bay Falso; where also the soundings are regular, with a clear sandy bottom. Ships must come no nearer the S. and S. E. parts of Seal Island than 22 fathom, for there are sunken rocks which extend near a mile off.

Simon's Bay is much more commodious for ships at any time of the year than Table Bay. The fresh water here is excessive good, and all kinds of provisions and refreshments are to be had here the same as at the Cape Town, and at the same prices. From Simon's Bay to the Cape Town is about 17 or 18 miles: the road goes along the side of the hills until you come to the Cavalry House; from whence it is flat, clear, and tolerably good.

For further remarks and directions see my Draught of False Bay and Simon's Bay, lately published, wherein are the views of the land, &c.

The E N D.

